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JULY, 1948
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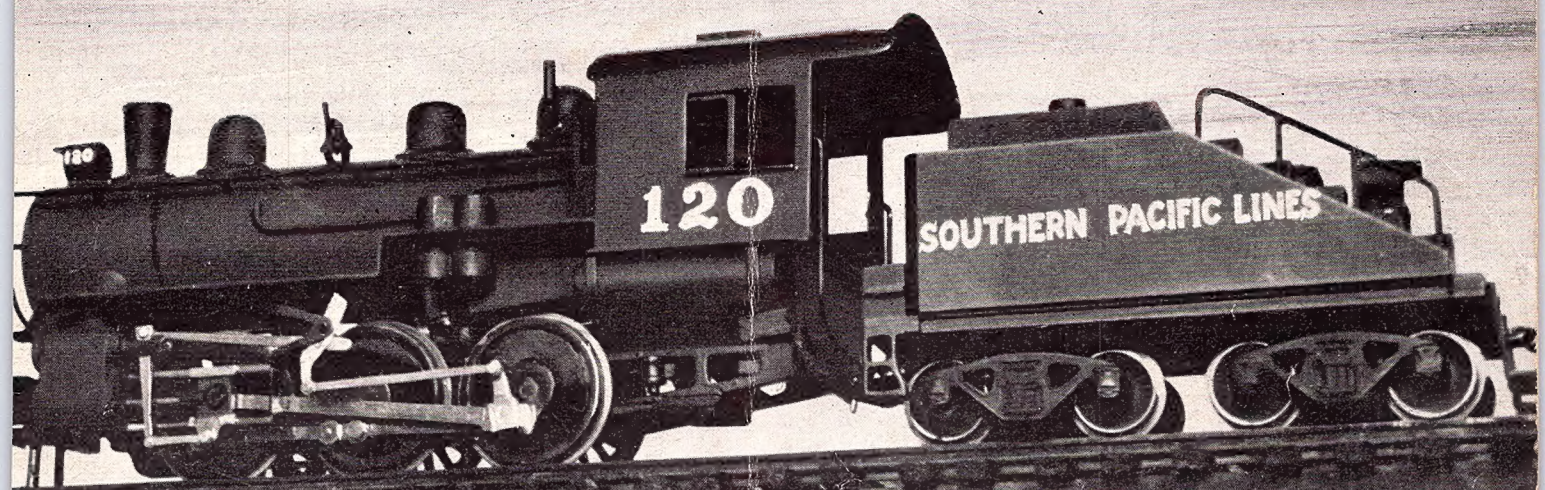

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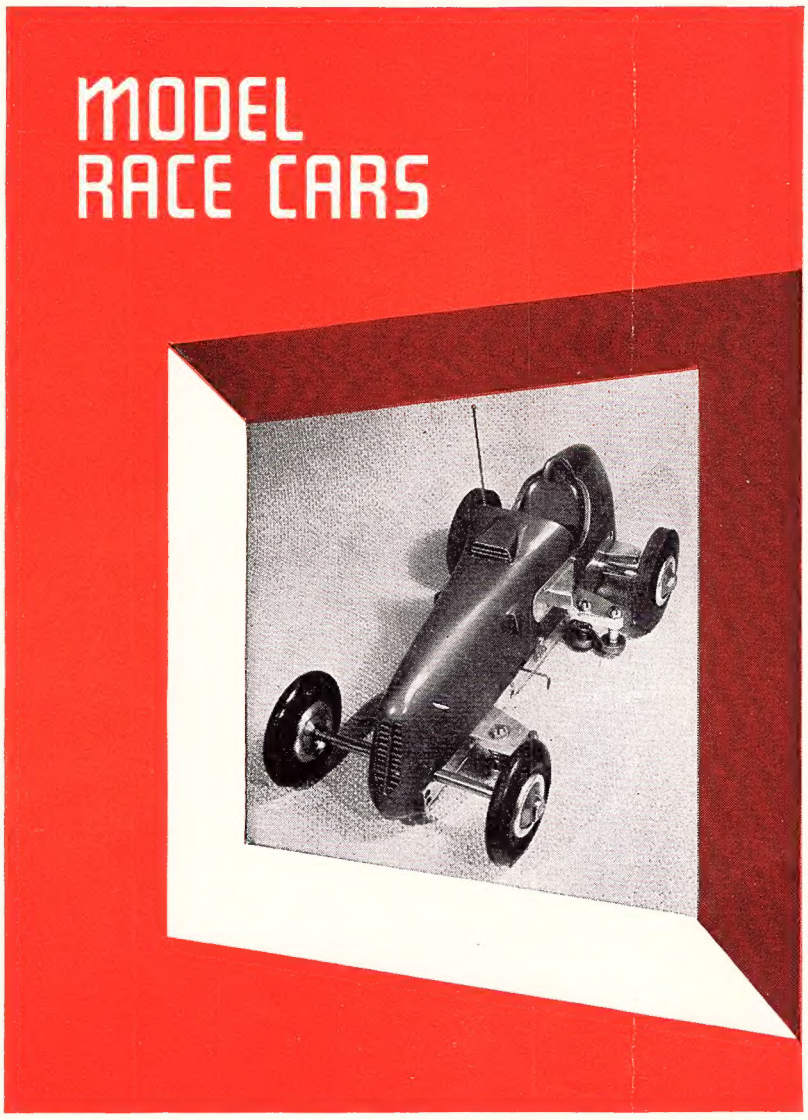

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THE MODEL CRAFTSMAN

Vol. 17, No. 2 July, 1948

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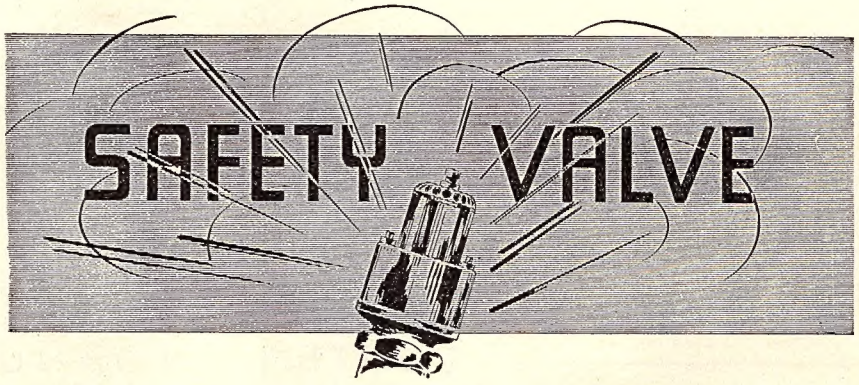


FROM DOWN UNDER

Just a short note in appreciation of your marvelous magazine, the Craftsman. I have been reading your magazine steadily since 1938 and my library of the magazine dates back to January, 1934, you can't imagine the trouble I've had in locating these copies. Model Railways are my main interest in life so you can realize how happy I am to see your latest issue.

How about another article concerning a simplified live steam in "O" gauge which appeared in the August, 1938 issue—yes, I said 1938. Time means nothing out here. If this letter seems to ask too many favors, please forgive, as there are NO American products or magazines for sale over here and when one is interested in American equipment, it is very hard to get anywhere. I would be very pleased to receive letters from any readers of your magazine as there are very few here that are interested in American models. So please swamp me with letters boys! I would be more than overwhelmed to receive a letter from L. J. Starr who wrote the live steam article I mentioned before.

How jealous your advertisers make me when I see the things you chaps can get at nearly every Model Shop. However, I will close now hoping you excuse all the moans and groans and all the favors . . . Norman Mitchell, Ashfield, Sydney, Australia.

THE CORRECT WHEEL BASE

Permit me to express my congratulations on your new model railroad magazine. Keep up the good work. In as much as your magazine seems to be more interested in problems of the trolley and interurban modeler, I would like to pass on an idea that has worked out well on my own equipment.

One of the bottle-necks in modeling trolleys is the problem of obtaining a power truck with the right length wheel base. It is possible to purchase some with a 7-foot wheel base, but the price is rather steep. For the HO gauge fan who does not wish to dig too deep into the food budget, here is a cheaper solution:

Purchase the parts for a Varney Power Truck (8 foot wheel base). Then take the castings for the "Upper Gear Box" part #1653 and the "Lower Gear Box" part #1654. Assuming that a 7-foot wheel base is desired, cut 3.5mm out of the center of each casting. Then take the "Bottom Plate" part #1655 and drill one of the holes 3.5mm closer together. Take the drive shaft assembly and force one worm gear 3.5mm down the shaft. Then assemble the power truck and you are all set to install your favorite interurban side frames. The entire operation takes about 30 minutes. This same process can be used to create a 6½ or 6 foot wheel base. Merely cut out an additional section . . . Contributors name unknown.

DIESEL FANS TAKE NOTE

I have been a reader of the Model Craftsman since September of '34 and have all copies to date. I'll admit the model railroading in some of these issues was slim, but I hung on and am very pleased to see a lot of valuable material in the current issues. I believe the April issue to be the finest since I started. In the April Safety Valve, "Oats for the Iron Horse," *name withheld by request* states that the iron horse will pass in ten years. Well, if anyone can show me a diesel that will last as long as a steam engine, I'd certainly like to see it. We have a 2-4-2 running on a coal train near here that was built by Baldwin in 1884 and is still going strong. It used to run near San Francisco hauling varnish before the arrival of street cars. The only present day diesels around in 2012 AD will be found in the neighborhood junk yard . . . E. Blackstaff, Nanaimo, B. C.

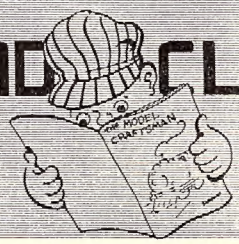
CORRECTION PLEEZE

Your new 100 per cent Railroad magazine is excellent and to preserve this standing with me, have your mechanical editor check the item on page 36 in the May issue regarding the lathe cut-off method.

Unless the lathe chuck is locked on to spindle, it will come unscrewed when running in reverse as the cut-off blade acts as a wrench or stop and bingo—a nice set of ways are ruined and somebody gets mad at you for letting out such information. The better way is to make a Holder which operates from the rear of work, tool upside down and running in the proper direction. Usually all screw machines, turrett and automatic lathes cut off from the back. The theory is that cutting off from the front has a tendency to raise the spindle in bearings and climb the cut off tool—from the back it holds the work down in the bearings and can slice the work off quickly.

I sincerely wish you good rolling with your enterprise . . . James E. Hess, Garland, Texas.

RAILROAD CLUB NEWS



OAKLAND, CALIF. On May 21-23, the Eastbay Society of Model Engineers held a very successful annual model railroad exhibit. The lighting of the "O" gauge layout was completely revamped for the show and special floodlights were installed. The HO layout, which has always been notable for its arrangement, was treated with "Flock" and many new pole lines and vehicles were placed along the roadways; its realism and charm drew many admiring comments. To insure trouble free running, a special 60 ampere rectifier was installed before the show and proved its worth. Trains always had plenty of reserve power and those in the cab and the dispatchers had one less mental hazard.

A fine exhibit of Live Steam Models was loaned by the Golden Gate Live Steamers. Some fourteen models of various gauges were on display. These ranged from "O" gauge working models to a train in 6½ inch gauge comprising a 4-4-0 coal burning loco and tender, flatcar, two hoppers, a gondola and caboose. All cars had operating hand and air brakes and the caboose was complete with bunks, icebox and stove. The weather was fine for the show. If you had asked any of the six thousand people who viewed the show, even the women, "What's your fancy?" they would have replied, "Model Railroading." In fact, some said so without being asked!

S. ORANGE, N. J. A new club has recently been formed, known as the South Orange Model R. R. Club. This HO enterprise has club rooms located at 4 Sloan Street where meetings are held every Tuesday evening. Applicants for membership may visit the clubrooms or get in touch with the Secretary, W. L. Anderson, 11 Norwood Terrace, Maplewood.

SACRAMENTO, CALIF. Hobbyists, those who make model railroads or turn out exquisite wood carvings, and who are finding pleasure in spare moments, are being invited to exhibit at a hobby show this year which will form part of the California State Fair, Sept. 2 to 12.

Ned Green, Secretary-Manager, has announced that more than 10,000 square feet of floor space has been set aside for a hobby show which is being presented at the Fair for the first time. Among the displays contracted for so far are two model railroad systems. The model pikes will operate over track laid a distance of 120 feet. They will wind for many additional feet through valleys, over bridges and through tunnels. The two systems will have stations, sidings and other equipment and will be completely operated by remote control.

CARMEL, N. Y. The local Model Railroad Club boosting a membership of ten, recently celebrated its first anniversary. The club is rapidly building an "O" gauge layout, already has over fifty pieces of rolling stock including six locos and presented its first annual show July 2, 3 and 5. The Club meets every Monday and Friday evening at 8:15 in Dr. W. P. Kelly's barn where a 50 x 25 foot loft, free from all encumbrances, provides space for the layout. Members from other Clubs are always welcome and, as usual, there is room for new enthusiastic members. Dr. Kelly is the President and Victor Roming is the Sec.-Treas.

HOBOKEN, N. J. The New York Society of Model Engineers, who will be hosts to the Northeast Region of the N.M.R.A. at the Spring 1949 Convention to be held over the weekend of April 30 and May 1, announce that plans are already well under way toward making this convention another outstanding success. Since there are no adequate facilities for hotel and banquet purposes at Hoboken, N. J., the Society's headquarters, it will be necessary to hold the convention at a hotel in New York. (The N.Y.S.M.E. layout is only 14 minutes from midtown New York. Chief obstacle has been the inability to find a hotel which will provide a banquet at the prevailing rates of previous Northeast Region banquets. At this writing, however, indications are that one of New York's first class hotels will provide one at popular prices.

The Committee is interested in receiving suggestions from those contemplating attending the convention as to their views on fan-trips, tours, etc., particularly with reference to providing entertainment for the ladies. Address suggestions to: George R. Brackman, % N. Y. Society, Lackawanna Terminal, Hoboken.

ELIZABETH, N. J. The New Jersey Model R. R. Engineers now have their HO layout in running condition with the exception of a few sidings. During the past few months, they have been working on scenery, the material being used is papier-mache. After a number of mixtures, they finally came up with one that gave the desired finished material when completely dried. In fact, they have had such a success with papier-mache that none of the members would ever go back to using anything else. The base of papier-mache is regular newspaper combined with sawdust, asbestos, glue, water-paste and plaster. When this combination is set in place, it takes the almost natural effect of rocks, sand, earth or anything one would make into the surrounding scenery. It's more of a mess to handle and work than most of the plaster or other mixtures in use, but for this outfit, it did the trick.

Visitors are welcome on any meeting night, only recently an open house was held and a number of outsiders were invited to spend the evening as guests—they were even allowed to bring their own rolling stock and operate it on the layout. The layout is about 45′ x 30′ in the shape of a large "U". Regardless of the size and the large number of scale miles of track, almost anyone could mount the engineer's control boxes and operate his own rolling stock. Plans are well underway for a large scale show to be held this coming Fall. By then the layout should be in perfect order, including complete scenery. The club is very anxious to secure several new members who really know bridge construction. The layout calls for 3 large ones, a drawbridge, a steel suspension and a large steel girder combination, which are now holding up progress.

HORNELL, N. Y. Negotiations for space for an HO gauge Erie Railroad are still under way for the recently organized Hornell Model R. R. Club. Of the 13 active members, all are NMRA members and 11 have home layouts. Membership is still open, anyone wishing information can contact the Secretary, L. E. Roberts, 7 Albion St. Also, anyone with information as to where they might acquire layout space could contact the secretary. (They can dream, can't they!)

PHILADELPHIA, PA. 500 feet of track were recently delivered to the Philly Brotherhood Model R. R. and the track gang hustled to complete all unfinished sections of their O gauge pike, the Philadelphia Belt Line. The Scenery Department is right up to date in landscaping the countryside and the Electricians are fast catching up with the track gang in installing the new block signal system and new control boards. Visitors to the Phila. Belt Line are always welcome on any Friday at eight — but not to disappoint anyone who comes to see the Varnish rolling — operations night is the first Friday of the month.

(*Continued on page* 50)

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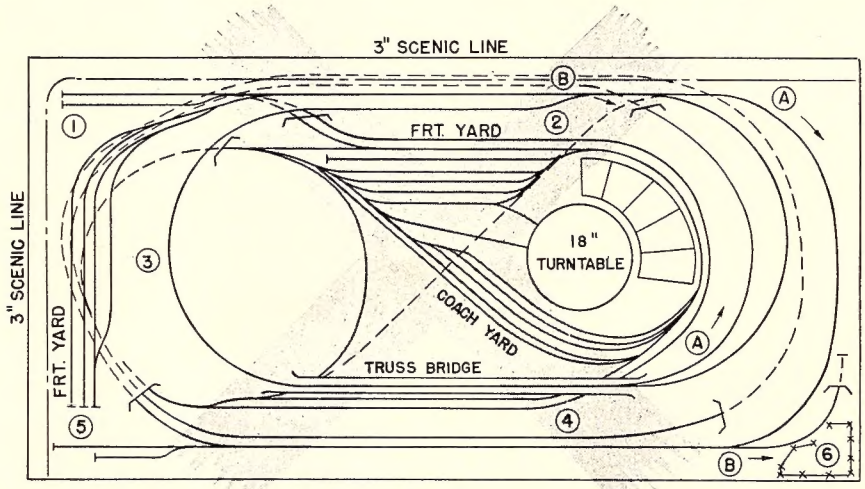
THE LAYOUT DOCTOR

GEORGE H. BARRETT of Washington, D. C., submits the first layout for treatment this month. It is presumably in HO gauge, although this is not stated and the space available is six by twelve feet. His problem as he states it is to reverse direction of train on upper level.

The old Doctor tucked his long white beard into his vest, took a needle full of liquid radius and got to work. The original Barrett layout has more to it than meets the eye—namely four switches in tunnels! It has a lot of trackage in the area, some of it useless, some of it impossible. One useless track is the wye track from the freight yard toward the front which only gives an extra oval—a small one for running around. The impossible trackage is the yards. Both are shown double ended, which is good, for it saves backing movements with the trains but sites for double ended yards in modeldom must be carefully chosen or you will run into what Barrett has—too short body tracks and impossible curvatures.

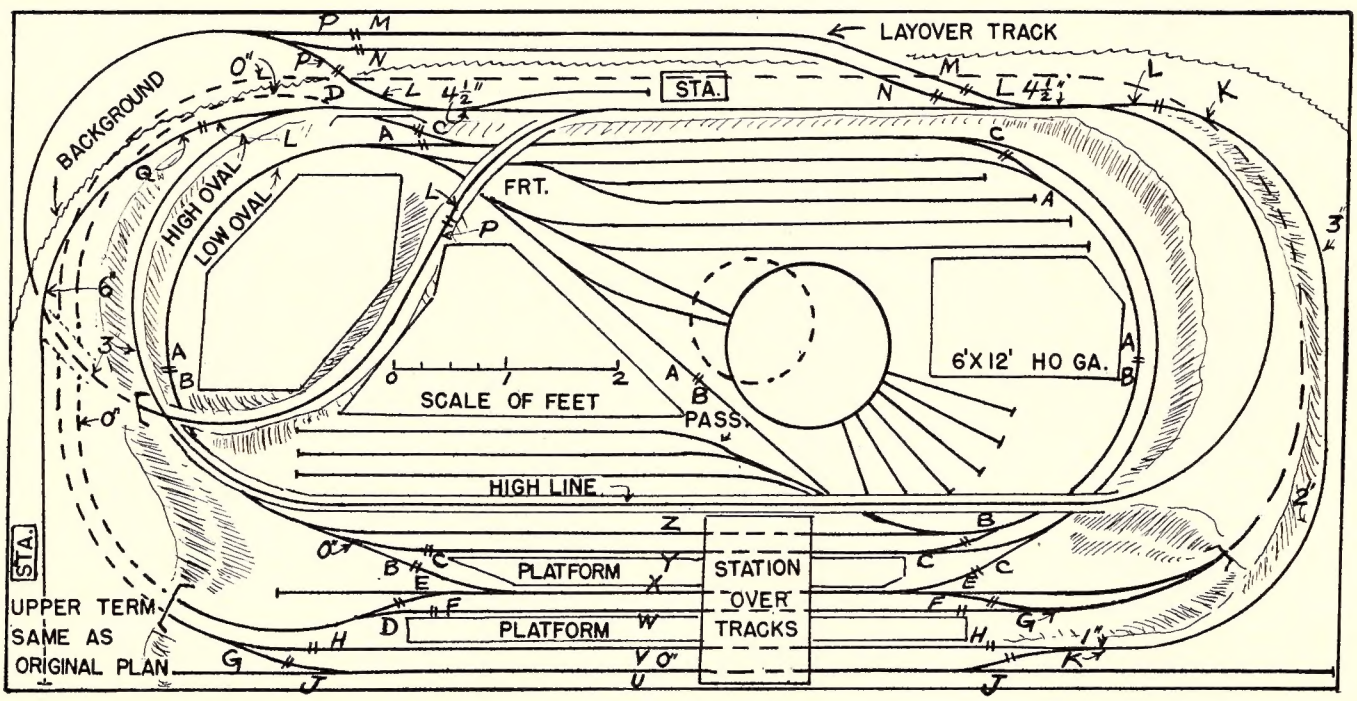
In my revision of this layout, I have kept the general scheme thereof but improved it to the point where operation will be not only interesting, but possible! To be sure it is not the layout I would build myself in the six by twelve foot space: a long run is accomplished by the expedient of winding round and round parallel with the edges, which is in the English model railroad tradition as expounded by Rev. Beal in his books. However, let's go!

The grand six track station at the front of the platform is starting point of passenger trains which must leave in a counterclockwise direction from track X or Y. They go in that direction on the outer track of the low oval to the back left corner where they switch into a tunnel to emerge at the front again (same station) on track X or W. Leaving the station, they plunge into a very long tunnel completely around the layout, to emerge again at the same station, but on track V. Leaving here a train would start climbing until it met the upper oval at the back right corner. The train could then circle this oval as often as desired before either (a) going



2 GRADES EXTEND DOWN FROM POINTS (A) (+5") TO POINTS (B) (0")

(1) STUB TERMINAL
(2) TWO LEVEL PASS. STATION
(3) FRT. & PASS. STATION
(4) FRT. & PASS. STATION
(5) COAL & GAS DEPOT
(6) STOCK PEN



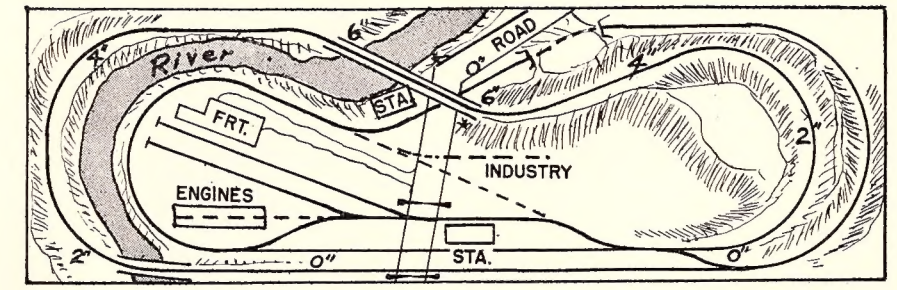
into the stub terminal at extreme left (which I have not indicated in detail); (b) looping around and then making the same journey in the clockwise direction back to the origin; or (c) running onto one of the hidden layover tracks back of the scenic background.

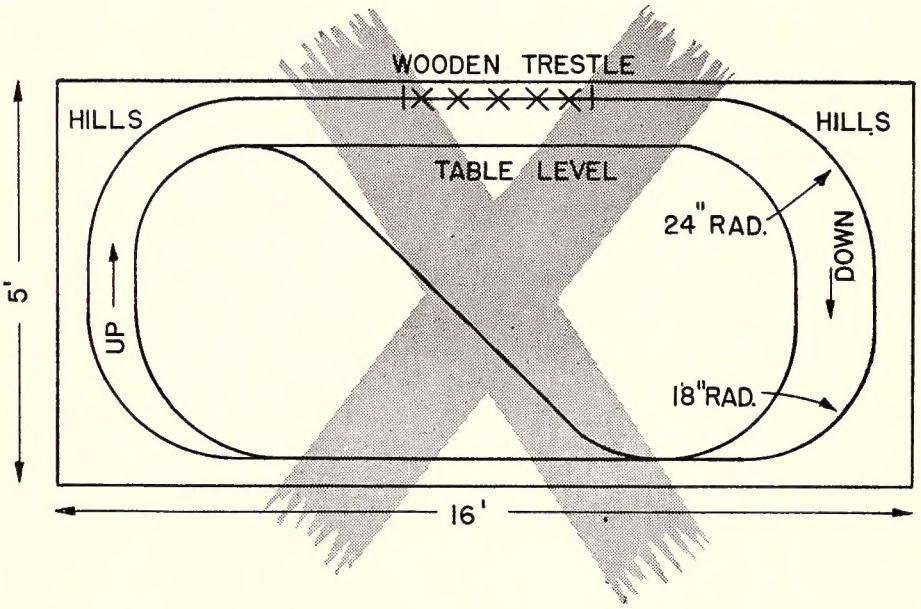
Passenger trains arriving at the big station pull in on tracks X or Y, while the engine detaches and runs around the low oval to the engine terminal. A switcher then pushes the cars onto one of the passenger storage tracks. An arriving freight train would continue on through the station on track Z, around the low level loop to the freight yard. The detached engine would then either run around its train, or keep on around the oval to reach the engine house.

The original layout plan specified an eighteen inch turntable which seems to me going a little far for HO or even OO gauge, especially considering the radius of the main line curves (minimum 20") and the length available for roundhouse stalls. While I have kept this diameter on the revised plan, I have also shown with a dotted circle how a twelve or thirteen inch turntable would allow more room for enginehouse tracks. As a matter of fact, I don't see much point in having a turntable on this layout since the diagonal line on the low oval makes a reverse loop for turning any size locomotive that can negotiate the railroad. I think it would be far better to have engine storage tracks, two or three in number, parallel with the diagonal track. This would also allow a little more room for freight yard tracks, although it would be necessary to keep the small access hole at the right end. This hole allows access to the switches at back right, and to the ends of the freight yard tracks.

Division into control blocks (each with its own DPDT reverse switch) is indicated by letters A to Q with I and O not present. As a matter of simplicity, at first all blocks could be installed, but wired to the same DPDT (in parallel of course) *except* A and P which are on reverse loops and must be separate. M and N, the layover tracks, would be temporarily wired with Block P.

Construction of this model railroad, I believe, should begin with the lower oval which should be well completed with both yards. Although I have drawn the plan so that it appears that some switches come under bridges, I believe this could be changed in the actual making by a little finagling on the minimum radius which is now 20". With the low oval completed, you should then swing off at back left as described in the route of the imaginary train above and build around to tracks X and W in the grand station. This would be a temporary outer terminus. By the way, the stub tracks extending from each end of station track X are for engines so that you can change engines on your trains at this "division point." Next construction would continue on from track W around the back to the main station again but tracks W and V which would be temporarily "end of track." The next stage would be up the hill to the upper terminal and reverse loop. Final stage would be the high line across the front which would complete the upper oval. Notice the level crossing between this high oval and the reversing loop at center left. This is designed as a curved crossing, but I believe that with a little chiselling on the curve radius, a 45° crossing could be utilized.





The original design also had a ramp coming down from the high oval, but I have eliminated this since the reversing loop up there permits a train to come up and go down the same incline. The old down ramp could be included in the layout by switching off the inside of the high oval at the right end of the high line, and swinging around approximately on the break line of the embankment there. It would then disappear under the high oval and continue on down, running between the two tunnel tracks at left end (which would have to be far enough apart) to a switch in the open at the front, left end of main station. Anything to keep a switch out of a tunnel! Along that line, the switches from reversing loop to the hidden layover tracks are behind the scenic background which should be removable at that point for access from the hexagonal pop-up hole at the left end.

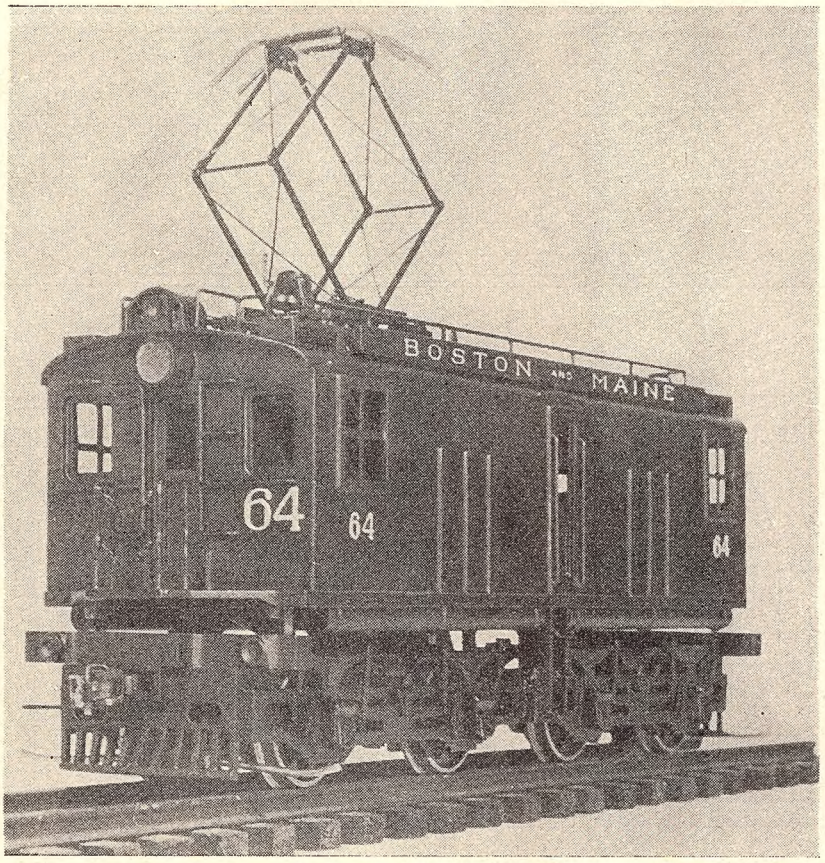
Glance at the schematic diagram of this layout and you will see that is a long single track with two passing sidings and a reversing loop as well as an oval at each end. With proper manual controls (and enough hands) it should be possible to run four trains at once on this line, three for sure and two easily. There are few industrial sidings so operation would center about the two yards and engine and car manipulation at the main station. Another possibility is to have no main line passenger trains enter the upper terminal, but halt at the station at back center before they take the reverse loop or go to a layover track. A gas car or interurban waits on the siding there for the short run into the upper terminal.

THOUGH simpler by far, the O27 gauge layout presented as a problem by Joseph Ristuccia of Oceanside, N. Y. admits of a much more interesting (to me) solution. Mr. Ristuccia's layout is, as he says, sort of monotonous just watching it go round and round. What he wants is a yard with some sidings where he can do some switching. He would like to keep his mountain division with its trestle if possible.

O.K., Joe, here we go. You don't say whether you are using tin plate or built up scale track and switches. but I believe this solution will answer for either with some distortion of shape if you must stick to tin plate track units.

First of all, I see you have two tangent ovals with one diagonal cut-off track which lets you reverse a train if running one way, but not if the other. The simplest improvement on this plan would be to add another diagonal cut-off at about right angles to this one. This would give you a figure eight inside an oval, an old tin plate formation—plus an extra oval. Then try to run two trains at once over the trackage without many smash-ups. But you say you want switching!

(*Continued on page* 41)



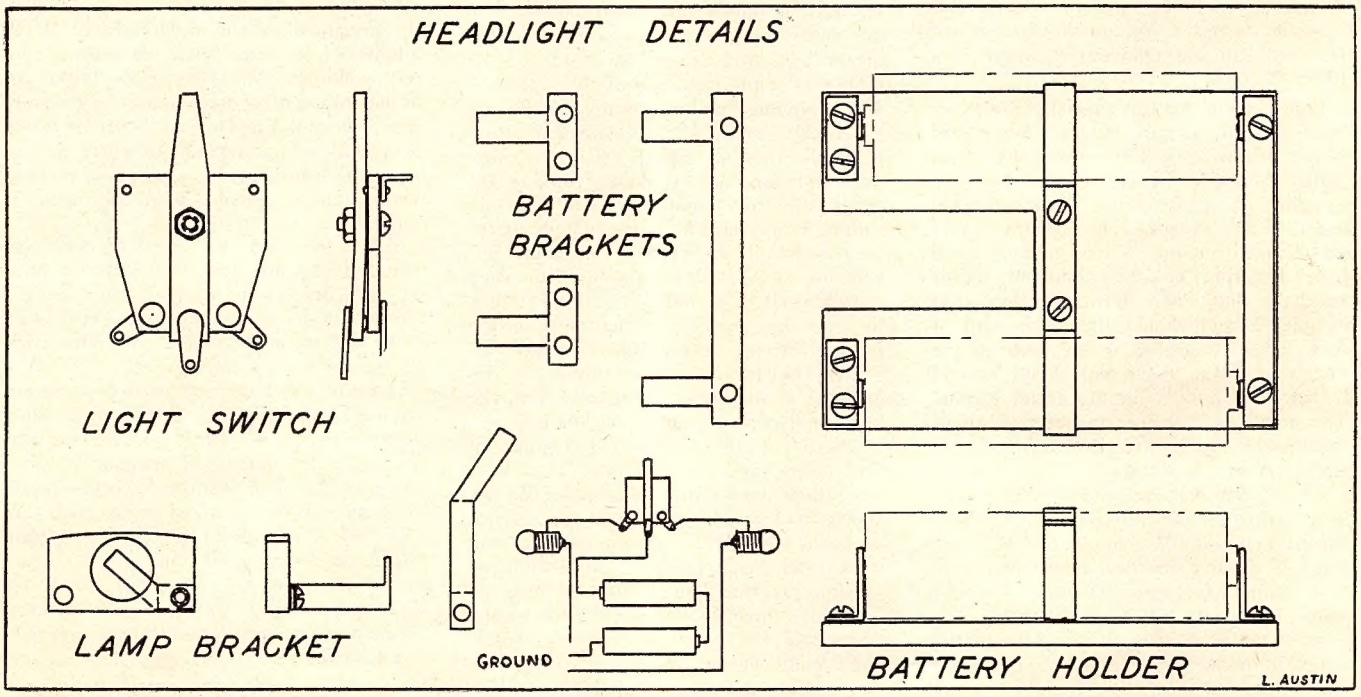
General Electric 0-4-4-0 Locomotive

PART IV **By LEWIS AUSTIN**

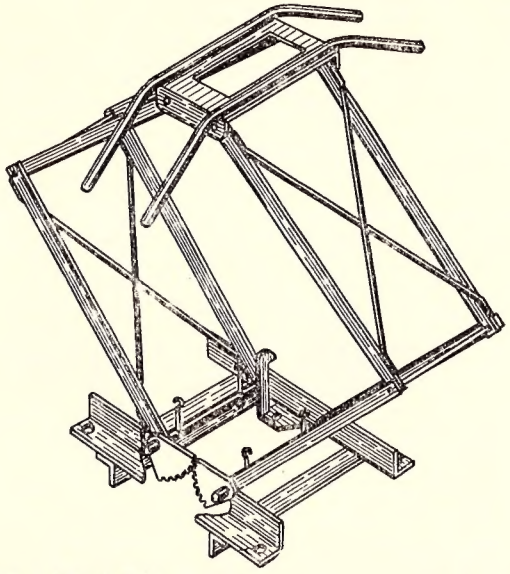
ALL that remains to complete the model is to add the remaining roof details, make the pantagraph and install the batteries and lamps for the headlights. The brackets for the lamps are made out of 1/8" thick linen bakelite. The large hole in the center of the bracket has to be just the right size so that the glass part of the lamp will fit into it. The base of the lamp should not go into the hole but instead should rest against the edge of the hole. The lamps are of the type used in pen-lite flashlights with the lens blown right in the end of the lamp. The end of the lamp is smaller than the base which makes it possible for the lamp to fit inside of the 3/8" tubing that was used for the headlights. The other part of the bracket is made out of a strip of 1/32" by 1/8" brass and acts as a clip to hold the lamp in place. The 2-56 screw that holds the clip and lamp bracket in place on the end of the loco body also grounds the lamp. Before mounting the brackets in place, cement a patch of friction tape on the underside of the roof where the brackets are to be mounted. The lamps are mounted quite close to the roof and the metal lamp base may come in contact with the roof causing a short. After the brackets are in place insert the lamps in the holes and press them in place against the brass clips.

The battery holder is built up on a piece of 1/8" linen bakelite. Make the two short and one long clips out of 1/32" sheet brass. These clips are fastened in place on the bakelite with 2-56 screws. Do not be afraid to tap the 2-56 holes in the bakelite for it will hold the screws just as well as any other material. Two 2-56 holes are tapped in the roof of the loco so that the battery holder can be fastened in place with 2-56 screws. The cut-out in the holder is to provide clearance for the light switch which hangs down between the batteries. A clip is made out of a strip of 1/32" by 3/16" brass to hold the batteries securely in place.

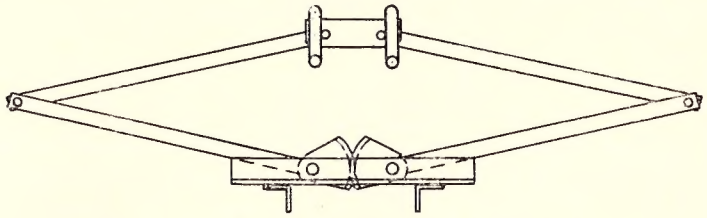
(*Continued on page 47*)



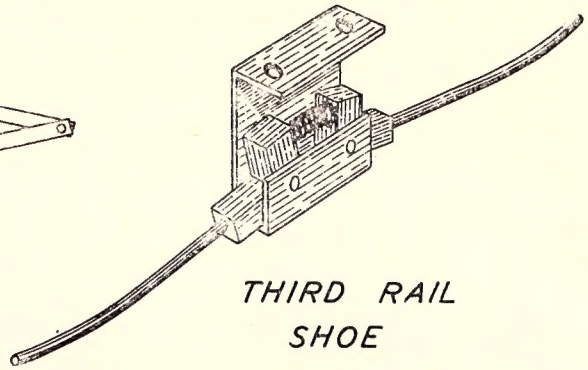
GENERAL ELECTRIC 0-4-4-0 LOCOMOTIVE



PANTAGRAPH

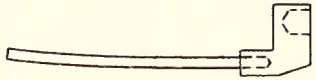


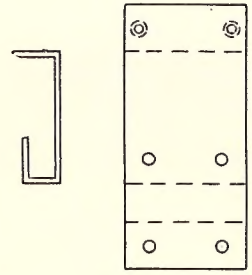
SIDE VIEW OF PANTAGRAPH



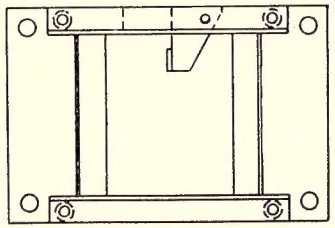
THIRD RAIL SHOE

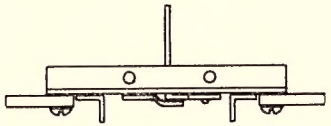
PANTAGRAPH SUPPORT
MAKE 2



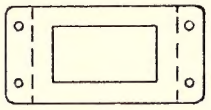


DETAILS OF
THIRD RAIL SHOE





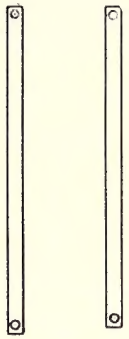
PANTAGRAPH BASE



TOP PLATE

CATCH

CATCH SUPPORT



ARMS

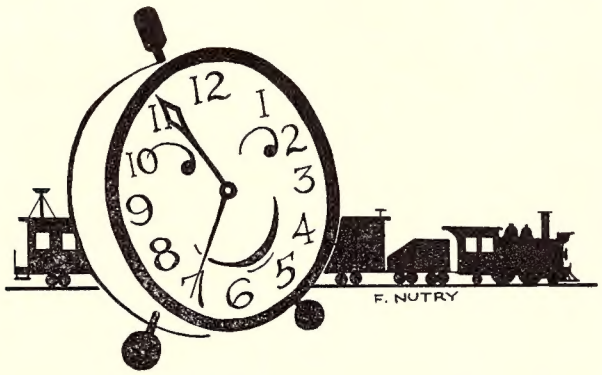
TERMINAL BOX

TERMINAL BOX COVER

VENTILATOR
MAKE 8

DRAWINGS ARE FULL SIZE FOR O GAUGE

L. AUSTIN



My Model Railroading Career

By ROBERT GREEN

IT all began in 1945 when I traveled across the country. It was on the Pacemaker between New York and Chicago that I first realized the greatness of the Railroads. When we arrived in Chicago the following morning, I began to think about building my own railroad empire and the idea remained fast in my mind until returning home a month later.

Not knowing anything about scale model railroading, I purchased a second-hand Lionel set. With this as a beginning, I built a layout occupying a space of 10 x 12 feet. Everything was going along fine until I went down to a local model supply dealer and saw a scale O gauge passenger car. I was swept off my feet by the beauty of it! The very next day I purchased a Walther Pullman kit. When I brought it home and told how much it cost, I was almost bodily thrown out of the house! I finally convinced the little woman of its value and life once more returned to normal. The car took me about a week to complete and it sure came out fine. I was real proud of it and placed it behind my one and only locomotive and started the train. She rolled down the nine foot main line with ease, but jumped the tracks when she hit the curve. At first I did not understand why this happened, but later found out that an eighteen inch car could not make a fifteen inch radius curve. The following week I went to another hobby shop and bought a few books about trackwork and equipment. These books plus a copy of the Craftsman kept me busy for quite a few weeks. I then realized that I would have to convert to scale O gauge. I felt as though I knew a great deal about model railroading and began to take apart my tinplate layout.

That same winter I put down O gauge track having a radius of three feet. I built six freight cars and two passenger cars and used my old locomotive which was a Lionel modified Hudson. Before I even had a chance to build scenery along this railroad, the family decided to move into an apartment. My railroad was sold with the house. The new owner is still continuing with the work where I left off.

Our new apartment was small and I had no space in which to build a railroad. By this time I had sent away for the catalogs of the various model companies. It seemed as though HO was the only gauge left for me. I purchased a few Mantua cars and a Varney Dockside. I ran this equipment during the spring of '46, but was not very happy with it because of its small size. So I was hunting for a new gauge once again. O gauge was too large, HO was too small. I did not like OO because of its odd size. It seemed as though S gauge would be just fine. Set upon the idea of building an S gauge layout, I had to find a place in which to build it.

We have a summer home in Peekskill, which has two glass enclosed porches, each being 10 x 30 feet. After a few days of pleading, I finally convinced the family to permit me to start work. There was lots of lumber around for me to use and a full workshop at my disposal. The wall of the porch holding the main building was solid stone. This plus the fact that the floors were pitched added to the difficulties of building the benchwork. I built the framework for the table from the floor up making sure that it was all level. The table itself was 10 feet wide and 20 feet long, with lots of room for future expansion. This part of the layout took two weeks to build, working about five hours a day. I planned to call it the Putnam Valley R. R.

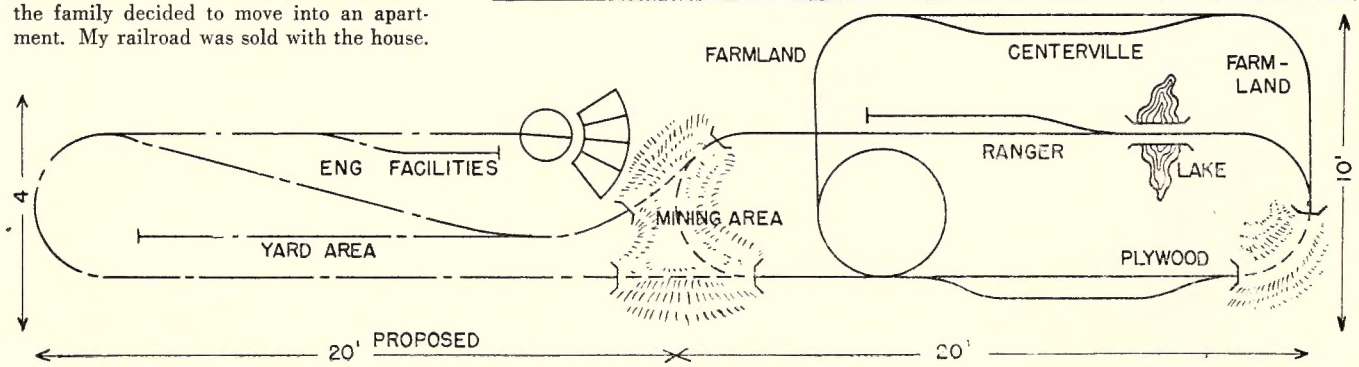
A. C. Gilbert came out with $\frac{3}{16}$ inch scale equipment which suited me fine. All that I had to do was to add some details to the cars and locomotives. I used American Flyer track and added wooden crossties. Within ten days I had fifty feet of track down, with a Hudson (4-6-4) running. After that I slowly added more track and switches. The layout is run on D.C. current, 12 volts, which will enable me to run scale equipment. As things began to shape up, I bought a Pacific (4-6-2) and an Atlantic (4-4-2). As for rolling stock, American Flyer predominated, adding underbody detail and brakewheels. I have constructed several Midgage reefers and like them very much. At present twenty-four freight and ten passenger cars roll on this pike. My crack passenger train is called "The Ranger" (named after my dog) — its makeup varies from day to day, but always includes an observation car. I have three midgage coaches, three American Flyer Coaches, one

(*Continued on page* 42)

PUTNAM VALLEY RAILROAD
Timetable

Effective — July 1, 1947

Stations	16	68	26	10	22	58	40	38	90	50
Centerville	1:00	1:15	1:52			3:45			4:40	
Cliffton	1:08					3:54				
Boxtown	1:14	1:23	2:04	2:30		3:59			4:52	5:37
Ranger					2:59			4:30		
Plywood					3:03		4:01			
Wayne Uct.	1:38				3:25				5:14	6:00
Muncie	1:45	1:46		3:15	3:35					
Bootville				3:30	3:50			4:35	5:35	6:30
Mt. Bob			2:25				4:29			
Ranger			2:40	3:35			4:38			
Moon						4:30			6:05	



Automatic wyes for street railways

By LONG VALLEY ELECTRIC RAILWAY

TO date no reliable scheme for changing poles on model trolleys has come forth, so at clubs and on large private layouts where car lines end beyond the convenient reach of operators there is a problem of changing over for the return trips. Single end cars add to the problem since they must actually be turned around. The most obvious way to handle both single and double end cars is to provide a return loop at the end of each line, but this arrangement is not always convenient since space on a model layout is generally at a premium.

The street railway system in Minneapolis-St. Paul operates single end cars almost exclusively, and make extensive use of a trick wye system that is readily adapted to model use and will provide an interesting automatic operation in itself. Their basic scheme is to construct a wye at a street intersection so that a stub track runs a short distance down the side street where the cars can layover ready to pull out on the main street for the return trip.

Figure 1. shows a layout for single track operation at an intersection we will call Snelling Ave. and Highland Parkway. Cars going out Snelling reach the intersection and are automatically turned into Highland by spring switch A, normally set for turnout. They pass through switch B and layover on the short Highland stub track. Reversing, the cars back up against the poles straight through spring switch B, normally set for straight passage, then curve out into Snelling, opening spring switch C, as they pass through. Since switch C is normally set for straight passage, the cars go forward across the intersection and proceed down Snelling for another trip.

The key to the whole scheme lies in the location of the curves intersecting at switch B. Note carefully that the curve between A & B joins the stub track further down Highland than does the curve from C to B. This makes use of the fact that a pole can always back straight through a properly made wire frog. Thus when the cars back out of Highland, they do not start to turn up Snelling towards switch C until they have passed straight through under the wire frog at switch B.

Figure 2. shows the same basic scheme arranged at the end of a double track car line, and in this setup the names Snelling and Highland are more appropriately used. Only two spring switches are required and both are normally set for passage straight through. Cars going out Snelling turn off into the stub track beyond switch A on Highland. Reversing, they back straight through switch A, then through switch B and stop ready for the return trip down Snelling.

Incidentally, both the single and the double track wyes can be used not only at the end of lines but also at any point along the lines where street intersections are available. For a single track through line, install a power switch at point A to permit direct service on up the street. Figure 2. also shows a double track set up modified to add a power switch X at the intersection and additional trackage for through service up the street.

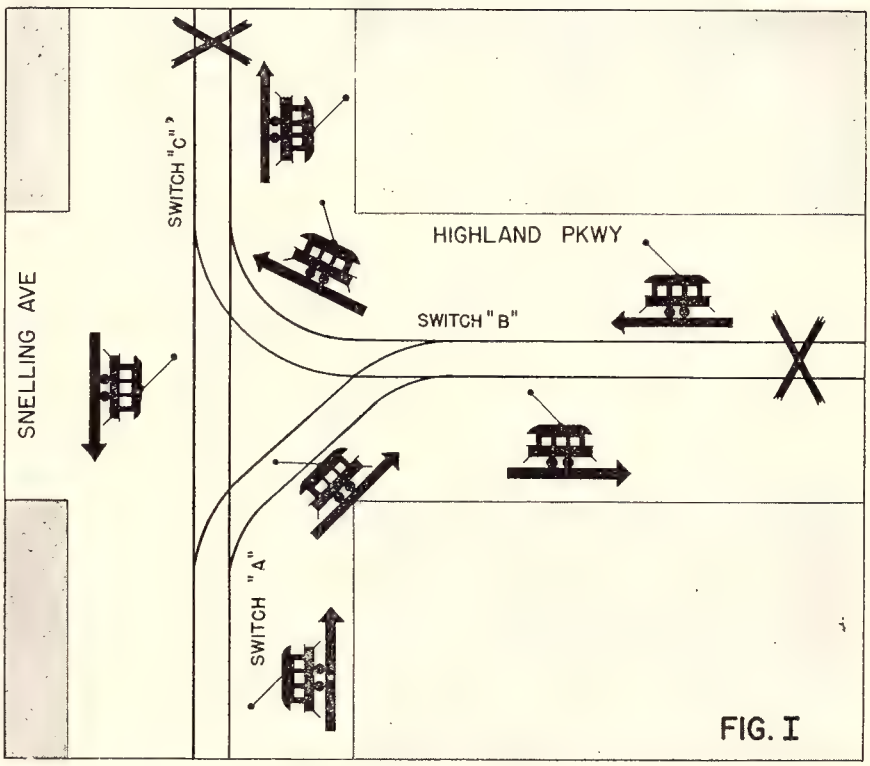


FIG. I

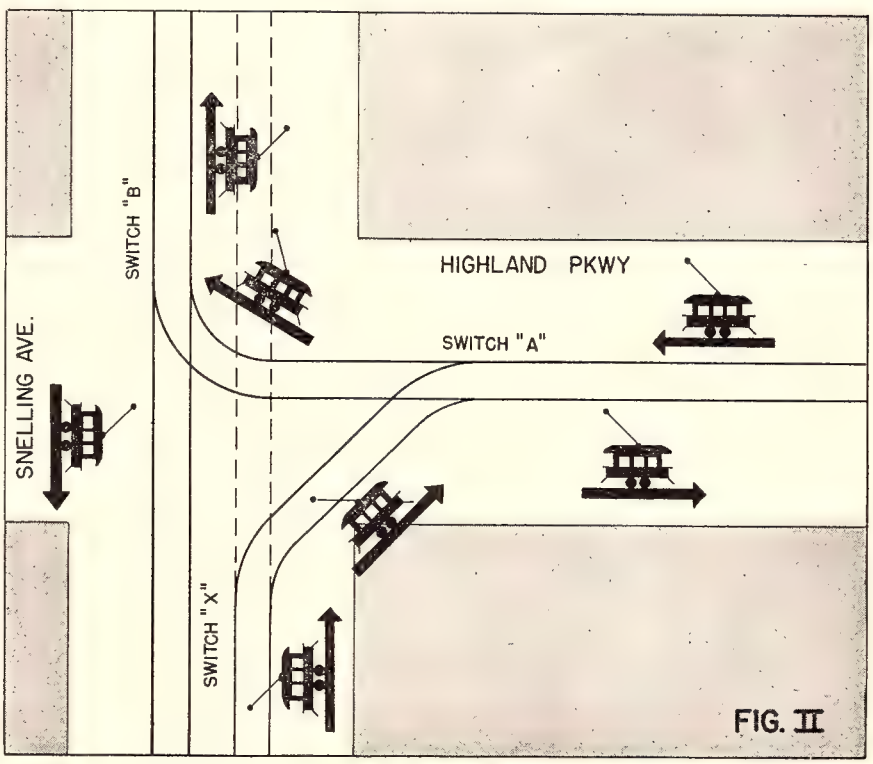


FIG. II

LAST month we got as far as erecting the framework of our layout. This is the skeleton of a model railroad, consisting of the long stringers and the cross members supported on legs. Now to start transferring the design of the trackwork from the scale layout drawing to the framework, I would suggest you start with a portion of the main line. By using the lines on the graph paper you can determine the exact point selected for the starting point and locate it on the framework. Now some sort of support is needed to span the open spaces between the frame members and keep the track from sagging, even though you use a roadbed such as Tru-scale. Well seasoned straight grained pine, such as toungue and groove flooring, is ideal for this. A good nailing job is probably all right, although I have always used wood screws which make for a more secure, permanent anchorage. In traversing curves you will have to either use wider planks or plywood. If you desire a really neat and workmanlike job, these may be sawed on a band saw to the radius of the curve. However, scenery, if installed, will camoflage any rough carpenter work. The important thing is to get this roadbed support down smooth. It is the very foundation of the trackwork and any irregularities here will be faithfully reproduced in the track, so be very careful in joining the ends of planks. If one plank is slightly thicker than the other, block up the thin one until they are perfectly level with each other. Use the level crosswire of the boards as you go and get them level.

On curves, it is advisable to drop the inside of the curve slightly below the level of the outside for better and safer operation. Also this makes it more authentic as the real roads adopt this method of overcoming centrifugal force exerted on the cars giving them a tendency to leave the track. This roadbed support only needs to be about twice the width of your track gauge but, as stated before, scenery added later on will conceal any surplus lumber.

At elevations or on grades, the roadbed is supported at the higher point by short pieces screwed to a cross member and adjusted to the height desired. When installing one of these, try holding it in place with a small C-clamp while checking the height or the percentage of the grade. The entrance to a grade should be very gradual and not an abrupt change from level to climb or drop. This may be done by creating a bend in the plank or by a bit of planning in the right places. Probably the importance of having the layout framework level and in the same plane at all points will be appreciated by this time. Any elevation on the layout can readily be determined from any point on the framework and the joining of various elevated points is a simple matter. Be sure to allow wider support where switches are to be placed for sidings or any double track.

Getting Started

PART IV

By JOHN R. BARKLEY

Now whenever you get tired of carpenter work you can relax with a little track-laying, besides, I know how anxious you are to see that box car roll. One of the first things you are going to need for a first class job of track-laying is a perfectly *straight* straight edge. A large carpenter's square may serve, otherwise get a yard stick at the dime store although it may not be straight enough for our purpose. The one I got really had a warp or curve in it. I took a strip of aluminum, fastened it to the yard stick with small flat head screws, counter sunk, then dressed the edge of the metal with a large file, using it the long way, checking it by eye to get it as straight as possible.

To get the ready milled style roadbed with ties cut in place, the job is a pretty simple one. However the curves can be improved upon by building in an easement to the approach of same. Simply slot a short straight section at the approach to the curve every 2 inches across the width of it almost through and then bend in the radius curve desired. This curve would be of slightly larger radius than the curve being entered. Thus cars will swing easily and gradually into the curve instead of jerking abruptly. If individual ties are used then any radius may be installed as you go. With some of the ties or roadbed installed you may start the track laying. Lay one rail at a time and get it all spiked down its entire length, using the straight edge butted up against it on one side while spiking the other. Check it by squinting along by eye as you go for it is surprising what kinks will show up that way. When that side is finished lay the straight edge along the side just spiked against the rail head and spike the other side. Any kink may be corrected at this time. Now use the track gauge to locate the opposite rail and proceed to get it spiked in place by the same method, using the gauge frequently to keep rails the right distance apart. Where rail ends are joined by rail joiners remove a shaving of wood from the ties at that point so that no hump will result from the thickness of the metal. Good track work is its own reward as you will see the first time a loco or car is tried, it really pays to use care in putting it down. In HO gauge, spikes need be no closer than one inch on ties or tie-strip. On milled roadbed two inches is sufficient. For the larger gauges they may be spaced further than that. Of course if you want to be really authentic place a spike in each tie on both sides. At that it won't be quite true to life as the real railroads use tie-plates and *two* spikes on each side of the rail in each tie.

With some track in place you can try operation any time you wish. Simply attach the track leads from your power source to the rail ends and let'er fly. Of course later on we will want to solder on jumpers across the rail ends for better current conduction and to get away from voltage drop. Meanwhile the rail joiners will carry the current. In time corrosion would create a resistance at such points so a soldered connection is much more satisfactory. We don't want to solder the rail joiners because a slight space must be left between the rail ends to allow for expansion. If the rail was all one unit any expansion would cause it to buckle at some points. Conversely, contraction would probably pull spikes loose on curves.

At the beginning of this series I said I would show you how to eat your cake and have it too, or how to operate your railroad though it is not nearly finished and keep it operating most of the time while construction is going on. One way to do this is a method used on my first small layout. It was a continuous run type that went around three times before arriving back at the starting point. In the attached sketch is shown how operation was had, first on one loop, then extended to two and finally three with very simple alternation of the track course. Something similar might be used with layouts of a different design. I also used a similar method on a much larger layout that ended up being a combination continuous run, point to point and out and home. By working out a plan such as this, much of

the monotony is taken out of layout construction and a lot of pleasure derived from it. Then too, trains may be run on the main line long before work is begun on the yards. As each new section of track such as another loop, yards, sidings, a reverse loop or what not is added, new interest develops and there is always something to look forward to.

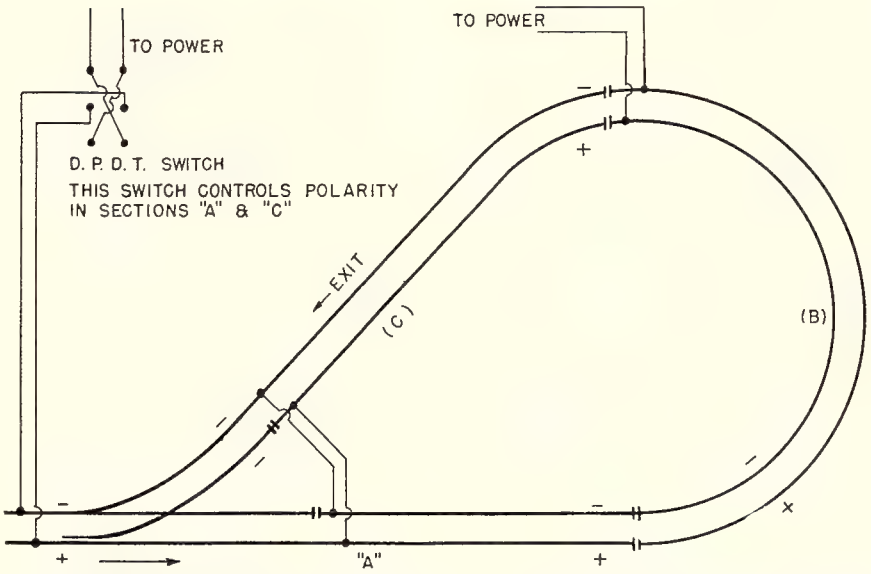
When you come to the switches it is advisable to purchase at least your first one. Examine them as to gauge, fit of the switch points and alignment through the frog. Installing a switch requires some patience. Start with the straight rail. When it is spiked in place take the frog and position it carefully, gauging it from the first rail and spike it. Now place the switch points so that they are lined up for a straight movement through the switch and gauge at every point. Fasten it with the screw through the pivot. Lastly, place the diverging rail down, gauging it from the diverging switch movements. Note that the function of the guard rails is to pull the rim of the wheel over so that the opposite wheel is guided through the frog so as not to foul on the point or junction of crossing rails. For smooth operation, be sure the wheels do not bind at any point.

If you do not wish to hook up the switch at this time it may be spiked over for one way operation for the time being. If the switch is carefully and properly installed no trouble will be encountered during operation. Be sure and get it right the first time no matter how long it takes. If you are like me you will hate to go back and do something over, especially after you have about twenty of them installed. An improperly constructed or poorly installed switch will cause derailments and probably make you wish you had never seen one. Switches may be operated by either flexible automobile choke cables or by electric switch machines, either method being practical and reliable. There are other methods but some are too complicated and others not dependable. A later article will go into specific directions and diagrams on how to install these. Right now we want to get the layout operating.

When the first loop or stretch of track is in a temporary wiring hookup can be used, or if you have gotten far enough along in your planning to have included a wiring diagram in the layout plan, you may install permanent wiring as construction progresses. Here again try to keep the wiring and control panel as simple as possible. I have seen (and built, *blush-blush*) control panels so complicated that unless a person was in constant practice, it was almost impossible to make many of the various movements without pulling a boner in the operation of a switch or in throwing power or reversing in a reverse loop. It is mighty embarrassing to have some visitors out for the first time after hearing a big buildup about your pike and have a train stall somewhere on the layout and absolutely refuse to budge. Then after about ten minutes of trouble shooting, apologizing, cussing under your breath, etc., you suddenly discover that there is a feedback of current

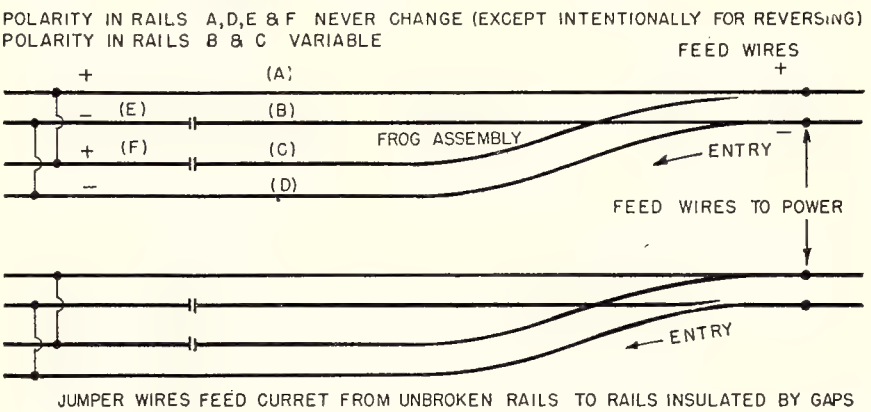
(*Continued on page* 43)

WIRING DIAGRAM — REVERSING LOOP

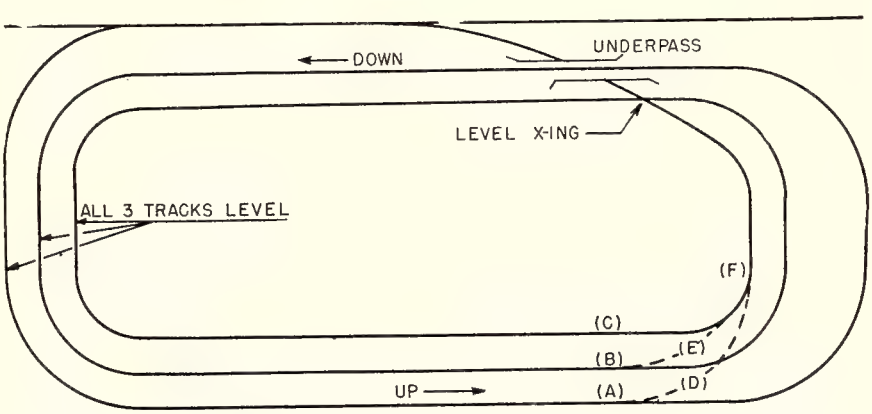


Entry direction. When train enters section "B" and is clear of "A", the DPDT switch is thrown, changing the polarity of both Section "A" and "C" and the switch is then set to receive the train from section "C". Section "B", on which the train is running, is unaffected.

WIRING DIAGRAM — SWITCHES

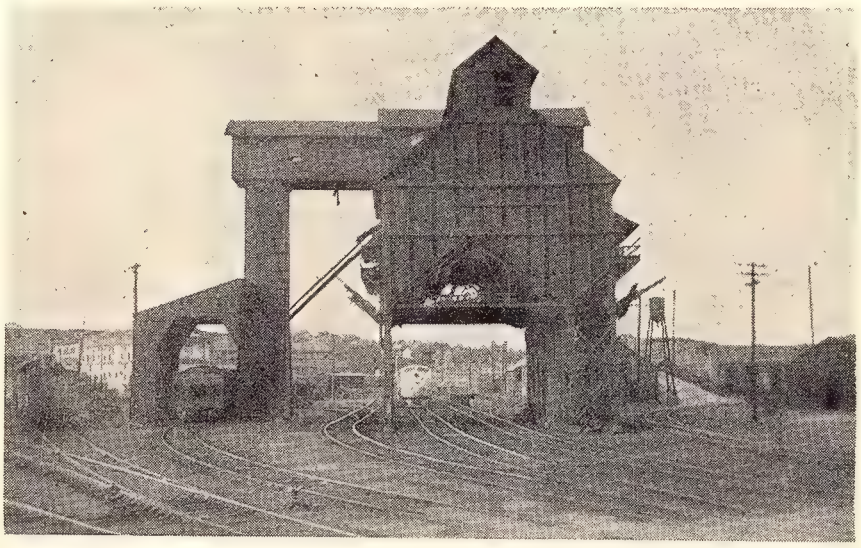


NOTE: See how polarity in rails B and C changes when switch position is changed. Entire frog assembly including rails up to the insulating gaps takes its polarity from the rail contacted by one or the other switch points.



Sketch showing how a start is made with one loop by swinging track A on dotted line D to meet track C. Construction resumed on A around to B. Track D is then moved to join with B while work is being done on second loop. Level X-ing is installed and when the cut-off is again reached, creating loop C, connection is made from E to F. Thus operation can be constant.

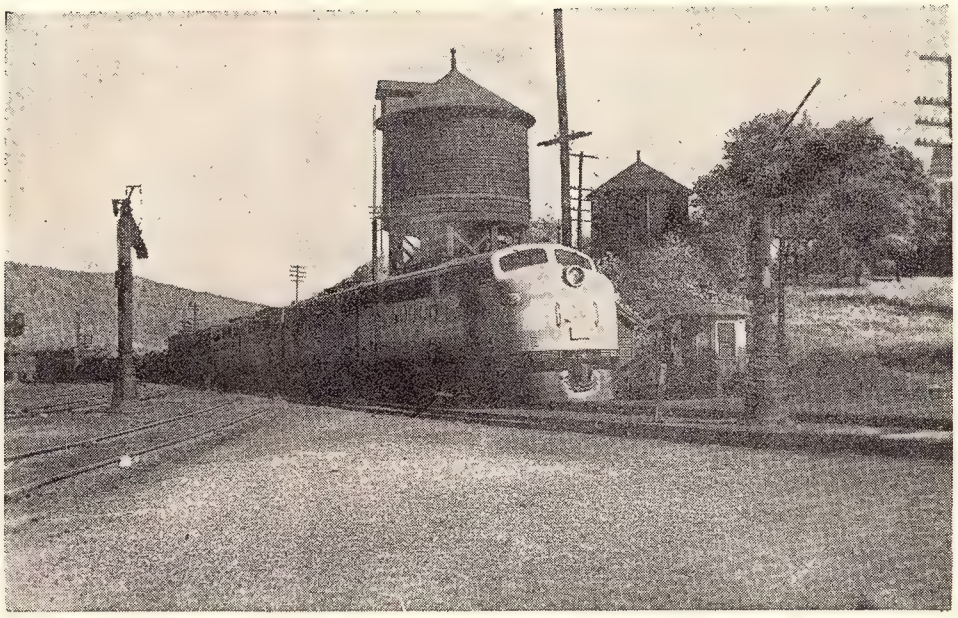
Watertower at Walton, N. Y. is typical of many to be found on the O & W You're right—it leaked!



Coaling Station at Middletown, N. Y. used to be busier. Note diesel on track leading under tower. When steam power goes, so will this.

Double tracked O & W is crossed at Campbell Hall, N. Y. by the single tracked L & HR.

The trestle at Ferndale, an all-steel structure. Note the rusty left hand track which has since been removed.



O & W freight drag westbound onto Scranton branch with EMC F-2, 5,400 hp. diesel on head end. (Cadosia, N. Y.)

ONTARIO AND WESTERN

By HAROLD H. CARSTENS

EVERY railfan has a favorite railroad—one which to him has engines that seem more attractive than those of other roads, right-of-way which is more picturesque or trains which are more photogenic or adaptable to modelling. Tastes, of course, as with beer, vary *but* nearly all rail fans spread in and around the Empire State will agree that the New York, Ontario & Western R.R. is one of those roads possessing that little something extra. Let's look over the old O & W then and see if maybe we couldn't adapt it to our own pike. There are all together too many model pikes with absolutely no purpose in life other than to go round and round until finally their creator gets so dizzy and also frustrated that he finally has to go see a psychologist.

The Old & Weary, as railroad enthusiasts affectionately call her, is a first class pike located wholly in New York State, running from Oswego, on Lake Ontario, to Cornwall which is on the Hudson River. At Cornwall, a connection is made with the New York Central's West Shore Railroad and traffic rights permit O & W trains to roll right into Weehawken, directly opposite 42nd Street in New York City, but of course, on the New Jersey side of the Hudson River. In addition to the main line, there are five branch lines; the most important of which is the Scranton Division. Another branch line was sold to the Unadilla Valley Railroad some years ago. The Erie Railroad also took over another branch.

The territory served by the O & W is very hilly, traversing the most elevated plateau between New York City and Oswego with elevations going as high as 2600 feet. Unfortunately, picturesque rolling hills do not in themselves produce much revenue. Much of the freight formerly handled by the O & W has either petered out entirely or has been diverted to trucks which daily clutter up the highways (including Route #17 in front of the MODEL CRAFTSMAN Editorial offices). As a result, the O & W has been in pretty shaky financial straits for some time and service isn't what it was back in the days of Chicago through service. Fortunately for all concerned, the Ontario & Western did weather the lean years, and thanks to aggressive management, is slowly bettering it's position.

Among the improvements which have been or are being undertaken are the elimination of over one hundred miles of double track and substitution of CTC (Centralized Traffic Control). Heavier 110 pound rail is replacing much of the lighter 85 pound rail formerly used. Efficient (less glamorous?) road diesels have replaced most of the museum pieces which formerly handled trains on the line. At last report, only one camelback engine remained.

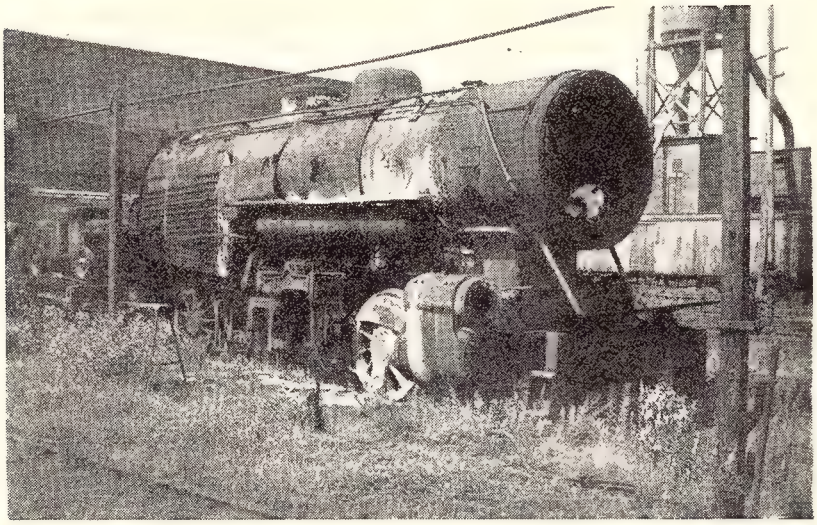
In addition to scrapping much of the old power, some of the modern Y and Y-2 class mountain type engines have been sold to other roads. Electro Motive freight diesels now handle the brunt of the traffic and are doing a good job.

DIESELIZATION

Ontario & Western management hope eventually to dieselize the entire railroad and the twenty-six diesels now on order will probably replace most, if not all, of the Ontario & Western's remaining steam power. Two of the twenty-six diesels, EMC F-3 type A units, have already been delivered and one is used daily on a milk train. Obviously, such a swing over to diesel power has repercussions among the railroad's employees. The once busy shops at Middletown, N. Y., are but a shadow of their former busy self. Economic conditions have forced the railroad to lay off numerous employees.

Steam power on the O & W ran the gamut from ancient 4-4-0 camelbacks (gone quite

Coaling station at Cadosia, N. Y., where the Scranton Div. meets the main line. Note the ever present hills and light rail.



O & W 312. Maybe some of the scrap steel from this locomotive found it's way into some model engine kit—or bus. Photo taken June, 1946.

O-6-O #201 A Camelback Consolidation is unfamiliar to most Model Craftsman Readers. The last of this class was scrapped in 1946.

O & W Engine 805 A & B with summer camp special of 6 NYCRR coaches on West Shore tracks at Dumont, N. J.

some time) to big, lumbering X class 2-10-2 type engines and the fast, modern 4-8-2 Y and Y-2 class engines. Today only a handful of steam power remains.

ADAPTATION TO MODELLING

Many interesting train make ups can be planned by following O & W practise. Since Coal makes up the bulk of the O & W's freight business, plenty of hopper cars are needed. Whole trains of coal are hauled from Scranton, Pa., over the Scranton Division and finally down into Weehawken, where the coal is dumped into barges on the O & W's coal dump. These coal drags are now hauled by 600 or 800 series F-2 freight diesels. Formerly the husky Alco Y-2 engines hauled the coal and, on several occasions, I have seen Ontario & Western trains on the West Shore double headed with a Y-2 and a two-unit diesel. Another time, a Y class passenger engine was coupled to a "small drivered" Consolidation. The smaller engine with it's rapidly turning drivers seemed to be pushing the larger! Although most of the cars are hoppers, there are usually some house cars to be found on the rear end of the freights.

As mentioned, the daily milk train is now dieselized with an EMC F-3 A unit. Consist for the milk train includes a number of milk cars together with some of the Borden cars which carry truck trailers, two to a flatcar; some box cars and an old wood coach which serves as a caboose. No passengers are carried but occasionally a rail fan group rides the car, after paying their fare and getting the necessary permission. Unfortunately there is no return train to New York so getting back is a problem.

The daily passenger train (No. 1 and 2) is still handled by a mountain type engine but will probably be replaced shortly by diesel. Consist varies but a typical makeup during the winter would be a railway mail car, mail storage and one or two observation cars. The observation cars have coach seats and do not necessarily have their open end to the rear. During the summer there is an increase in business, brought about by the many summer resorts served by the O & W. An extra train (Nos. 37 and 12) is added during the summer months. Until recently these summer excursion trains used ancient wooden coaches, replete with Pintsch lights and signs warning the passengers not to put too great a weight on the baggage racks! Recently, the O & W had been leasing cars from neighboring railroads so that last year, cars were seen, at various times, from the Lackawanna, New York Central, Reading and Jersey Central. Even a few Jersey Central locomotives were used!

As yet, diesels have not been regularly used on passenger runs but one exception last year is seen in the photograph of diesel 805 hauling a summer camp special past Dumont, New Jersey on West Shore right-of-way. The coaches are all New York Central. Purists will shreik at the sight of an F-2 freight diesel on the head end. Personally, I think it's interesting.

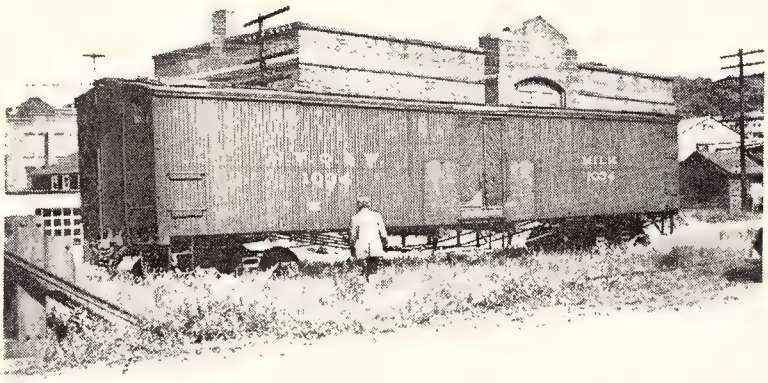
Most of the rolling stock has been scrapped. Occasionally one will see a hopper car bearing the legend "OW" on

the neighboring New Jersey & New York Railroad (Erie) or on the New York Susquehanna & Western Railroad. One ancient milk reefer, see photo, has been parked on a Middletown siding for so long that rumor has it the company is afraid to move the car for fear it will fall apart. No doubt a car most model railroaders would like to model.

Unfortunately the O & W's many interesting locomotives are not available in kit form with the exception of the EMC F-2 and F-3 freight diesels. This should not stop us from free lancing and patterning our line after the O & W. Most fans prefer the freedom which comes in free-lancing a model pike rather than the restrictions placed on one who models only one road cars and equipment. Not that sticking to one road is bad, opinions vary!

Your Ontario & Western can be modelled in an area of 4' x 6' or in a 40' x 60' cellar. Many excellent plans have appeared from time to time which are suitable for use with this article.

The O & W's #301, a class W 2-8-0 type at Cadosia, N. Y. Workhorse of the road, these are slated for replacement by diesels.



Ancient relic of a milk reefer. It's been parked at Middletown for years and rumor has it that the O & W is afraid to move it for fear it will fall apart. (Could be-) The enthusiast inspecting this relic must be a model rail—it would make a nice addition to any pike.

One of the last shots taken of the Ontario & Western's 0-6-0 Camelback #56. This locomotive has since been scrapped. Photo taken in July, '46 at Middletown, N. Y.

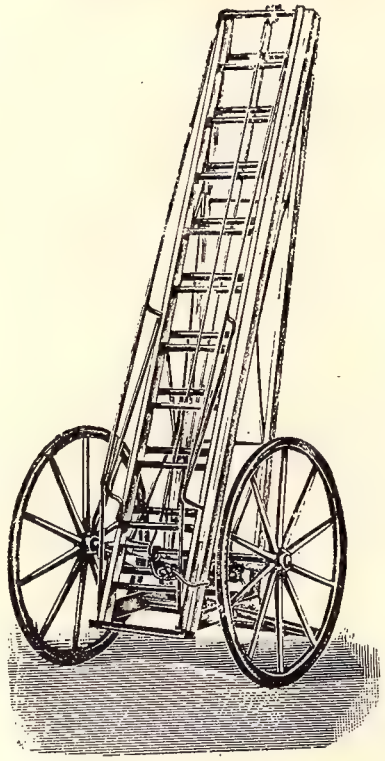
THE old steam fire engine of yesteryear was a mighty and glorious thing, and its reflection in working models was no less spectacular and entrancing. Models of modern gasoline powered pumpers are but as pallid ghosts compared to the working miniatures of the steamers, just as their prototypes are mere shadows of the snorting, smoking monsters that once raced down our city streets. Most competent authorities would agree that it is highly dubious if any boy who was born too late, to have watched in wide-eyed wonder from the curb as one of these steamers dashed by- can ever possibly be said to have lived a really full life.

The steam pumpers combined about everything—machinery, a steam engine, a pump, the inherent fascination of any fire engine with its crimson paint and bell; even a whistle. They were generally so well built—and so efficient— that many of the old horse drawn ones were later motorized with tractors, and continued in use in even the largest cities up until what amounts to virtually almost yesterday. Perhaps some of them are still in use somewhere; there have been rumors of some in the possession of outlying fire departments from time to time, but we must confess we have not seen one in actual service for perhaps fifteen years now, and we rather fear that an era has come to a definite end.

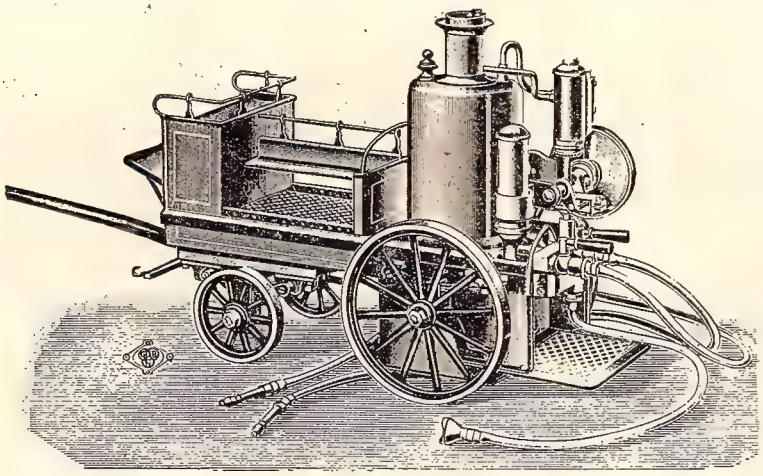
They were the wonder of the age when they were first widely introduced to replace the hand pumped engine. No one could imagine anything pumping so much water so high in so little time! Indeed, in more recent years there were rumors that they would actually pump more water than any gasoline pumper, and that the real reason for their banishment was the necessity to keep a fire constantly under their boiler in the engine house, or to delay pumping upon arriving at a fire for a minute or two until a full head of steam could be built up. Of the accuracy of this explanation for their replacement, however, we are not qualified to judge.

Steam fire engines first came into general use in this country in the 1850's, following a successful demonstration of an experimental engine at Cincinnati, Ohio, in 1852. A number of concerns then entered into the manufacture of such engines in both hand and horse drawn designs. For many years thereafter, hand drawn steam engines were popular and widely used, although in larger cities with paid fire departments, horses were generally favored.

The Amoskeag Manufacturing Co. of Manchester, N. H., is unquestionably the best remembered maker of these fire engines today, although there were a number of other firms prominent in the line at the time. Their fame is probably due to the fact that they developed what became more or less the archetype for all later designs, the engine with vertical cylinders and pump. This eliminated a great deal of the shaking when in use which was an objectionable feature of many other engines which were built with horizontal cylinders. Aside from the mechanical improvements, the Amoskeag engines were extremely acceptable from an esthetic standpoint, and their design is generally what one recalls when the subject of steam fire engines comes up today.



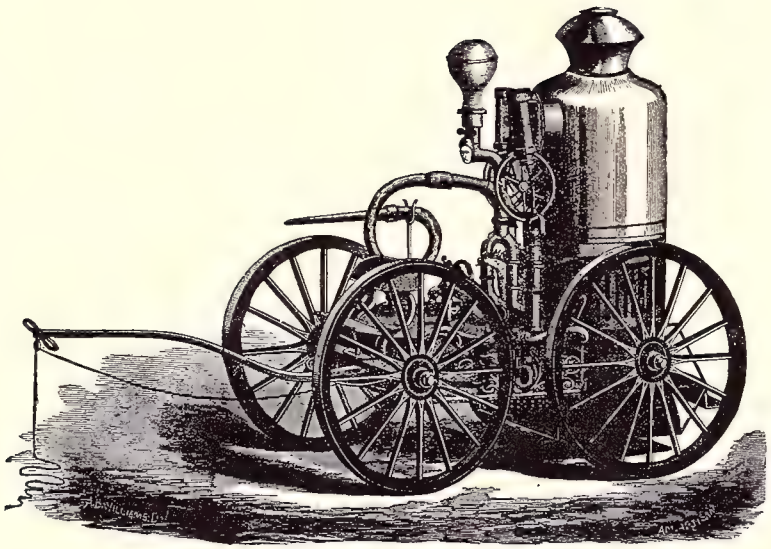
A Bing "Metropolitan Fire Escape," made for use as a companion piece to their pumper. It also dates from the first decade of the present century.



This is the Bing steam fire engine model of the early 1900's, and follows European design. It was 12" long excluding the shafts, 5" wide and 8" high, very well made, and extremely realistic in its operation. Note the suction hose in the right foreground, and the two hoses and nozzles between the wheels.

A combination of factors made the real engines very interesting, similarly, they were even more alluring when reproduced in a working model, for what other piece of miniature machinery combined a working steam engine, a pump and the ability to throw a tiny stream of water through a hose, with realistic reproduction of a real life prototype?

A few elaborate scale models of such engines were built, but the expense involved and the skill required put such miniatures beyond the reach of more than the most meager handful of enthusiasts possessing the requisite skill. Some of the detailed scale models are now preserved in public museums: there are nice ones, for example, at the Smithsonian Institute and at the Museum of the City of New York.



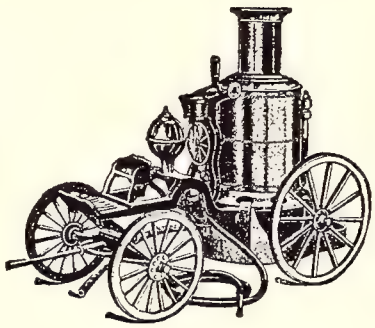
The Union Mfg. Co.'s improved pumper, shown here, was heralded as a "perfect working model" of the famous Amoskeag fire engines, when it was introduced in the 1890's. It was 18" long and 12" high, and later models picked up their water supply by suction exactly as did the prototypes.

To fill the needs of the thousands who desired working models of steam fire engines in the era running roughly from 1870 to 1915, became the task of the great mass-production model makers of the world, companies who were often classed as "toy manufacturers," but much of whose better workmanship was actually of the very tops in quality, such firms, for instance, as Bing and Weeden and another whose name is considerably less well known today, largely due to the fact that they never made model trains, the Union Manufacturing Co.

The last named firm was not only the pioneer in the field of commercially made model steam fire engines, but the most prolific of all the builders, offering a cataloged range of twelve models. That many of these were actually fine working models and far above the quality of most contemporary toys is indicated by the fact that they were sold for as much as $20.00 each in the 1870's.

The Union Manufacturing Co. were steam model makers extraordinary a decade before the more famous Weeden Manufacturing Co. of New Bedford, Mass., was born. They manufactured a line of inexpensive toy steam engines, as well as more elaborate engines, pumps, miniature machinery, the fire engines and a line of model steam boats that sold for as high as $50.00 apiece! This was a tremendous price for a commercial model in the 1870's. That they were actually custom model makers as well as production workers is clearly indicated by their solicitation in their catalogs of special orders for custom built models of a more elaborate and expensive type than their stock patterns.

The company was originally known as the Buckman Manufacturing Co. and began business in Brooklyn, N. Y., about 1871, manufacturing a toy steam engine patented by Alexander Buckman. Their line expanded rapidly and the first fire engine model was patented in 1872 by Alexander and Edward Buckman and production of it presumably started around that time. Later the firm had become the Union Manufacturing Co. and it appears that it was under this name that they reached their zenith. There was subsequently still another change of name, however. The original Buckman patent models are, incidently, still preserved in a historical collection.



The famous Weeden Mfg. Co. put out this more modern type of steam fire engine at a later date. The model pictured here was the last of these miniatures manufactured in any quantity.

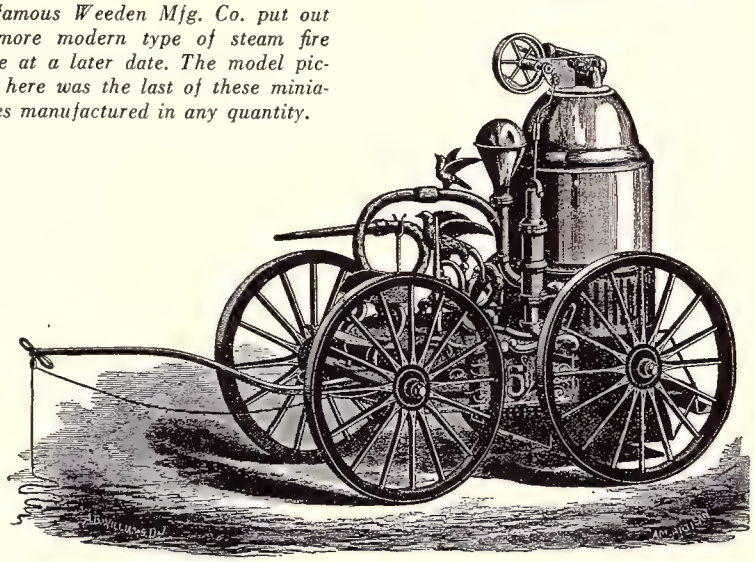
The original Buckman fire engines were self-contained units, the body of the engine consisting of a tank which was filled with water. When the engine was started, this water was pumped out through a miniature hose nozzle in a fine jet. Some eight models of this type comprised the line, ranging in price from $4.50 to $8.00 each. The steam engine proper was essentially the same as their regular stationary engine, being mounted on top of the boiler. All eight models were 18" long, but varied as to height and amount of ornamentation.

However interesting and authentic a model any of these engines may have been considered upon their introduction, they were soon eclipsed by Union's improved pumper which was introduced only two or three years later. This engine was claimed by the maker to deserve being classed as a "perfect working model" rather than a toy.

The improved engine far more greatly resembled the real thing; the boiler was correctly formed, and the cylinders p'aced vertically before it in the position more familiar to us today. It was advertised as a model of the Amoskeag engines, and did very closely resemble them. Of great technical importance, the water tank was eliminated in the later models and the engine supplied itself with an unlimited supply of water by suction, just as did the prototypes. The illustration of this engine shown here is taken from one of Union's catalogs of the 1870's and shows what was either an intermediate or experimental model, with the improved boiler and cylinders, but still fitted with an underbody tank between the wheels.

With the coming of the famous Weeden line of steam models in the early 1880's, and its rapid expansion in the two decades following, it was inevitable that this firm, too, would eventually produce a working steam fire engine model. This they did, in a single little model that was made up until past the first decade of the present century.

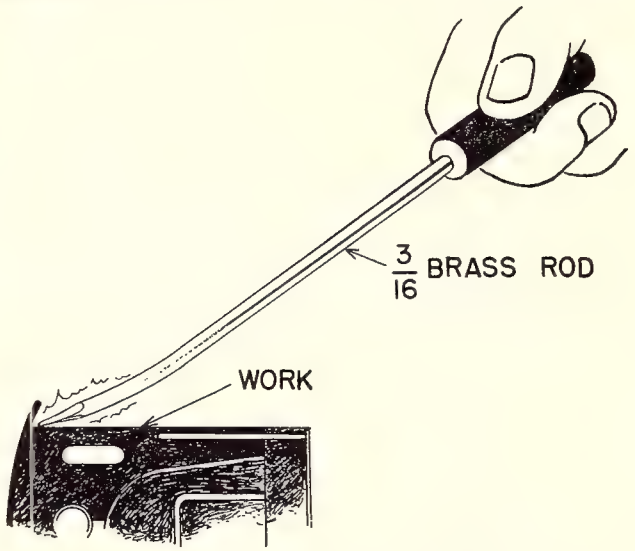
(*Continued on page* 39)

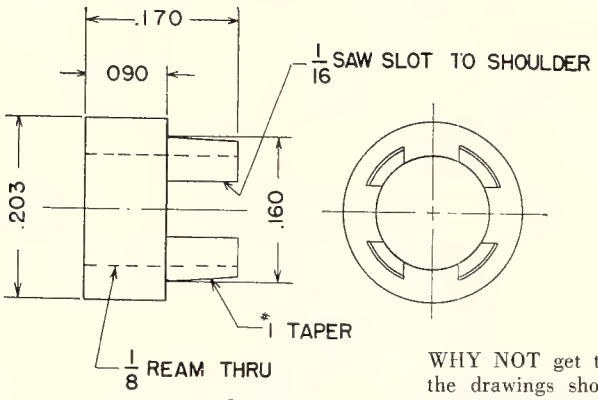


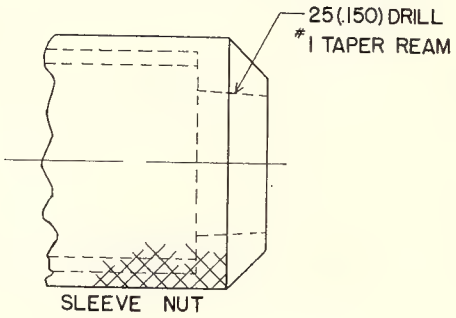
This illustration, taken from an old model catalog of the Union Mfg. Co. shows a typical example of the earlier type of Buckman or Union steam fire engine, with the steam engine mounted directly on top of the boiler. This model pumped water from a tank carried between the wheels.

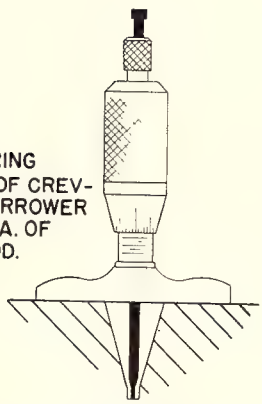
Why Not!

WHY NOT devise a special soldering iron to reach those "Hard-to-get-at" places? You can easily make up your own iron at home, the heat can be supplied by the kitchen stove. The iron itself can be a section of $\frac{3}{16}$ inch brass rod with one end given a slight bend and filed to a point. The other end can be fitted with a wood dowel for a handle. Solder and flux are placed on the work, the tip of the iron is heated red hot and is then touched to the work. No reheating is needed for small jobs common to model work, the one touch will do the job permanently . . . Bill Hoskins, Yonkers, N. Y.



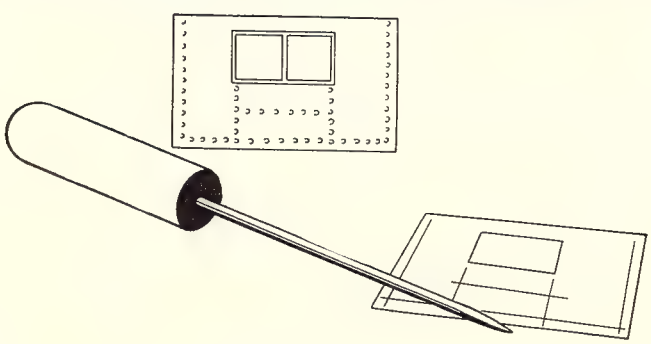






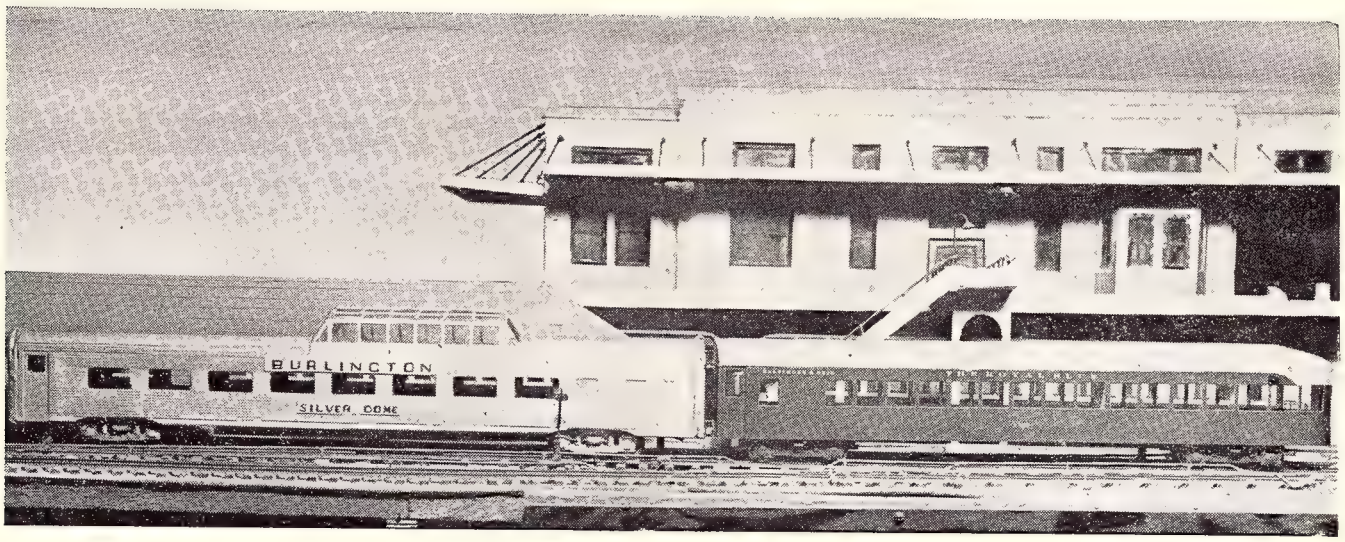
WHY NOT get the most use from your depth micrometer? As the drawings show, a small slotted sleeve from brass must be turned and a tapered reamed hole made in the knurled nut which holds the measuring depth rod in place. Doing this makes it possible to make individual rods for the tool, tapering the ends as desired to get into narrow slots or very small holes. The mic's capacity for measuring sizes can be greatly extended by merely making additional rods, of suitable length, from standard ⅛" diameter drill rod. A quicker movement of the micrometer spindle is possible by turning the small rod which protrudes from the sleeve nut.

Check drawing for dimensions of the tapered reamed hole in the sleeve nut and assemble. Use, as originally intended by the manufacturer, is not spoiled by the addition of this hole if these sizes are followed. If desired, another nut may be made to these dimensions, or a replacement purchased which can then be altered to suit. This is a small item . . . E. Diskavich, Torrington, Conn.



WHY NOT get realistic rivet detail on your freight and passenger cars? For car sides that are made of tin plate, the ice pick and hammer method is the easiest. The rivet lines are measured and marked off on the back or inside of the tin with a very sharp ice pick. Then go to work with the ice pick and hammer, tapping indentations at the specified intervals. "Rivets" are best painted on wood or cardboard sides.

If worked to scale, rivets can hardly be seen on the model. You will find that oversize rivets look more lifelike! . . . G. H. Grimes, Tucson, Ariz.



Streamlined Cars

By WARREN B. CRATER

WHILE building a train of Streamlined cars for my New Jersey Terminal R.R., I am not limited to one prototype. Rather, I am taking a car from each of several prototypes on as many different roads. For the reader who wishes, the window and door arrangements of the several cars may be combined with any one of the streamlined or streampainted styles shown in this series or still another taken from one of the many prototypes. Obviously all cannot be included in an article of this type.

Admittedly the cars shown here are the ones with which I am familiar. Many of them I see almost daily and the express cars of all lines represented show up locally from time to time.

In assembling a selection of cars for "The Mixed Breed," I have chosen a number of color combinations between the diesel and a red, white and blue rear end. The red is a Lehigh Valley coach of the "Black Diamond." The white is a Burlington "Vista Dome" and the blue is B & O "Royal Blue."

Since the round observation and the dome require individual construction, let us take them in this first article. After this, due to similarity of details, we can take several cars in one monthly section. As to outward appearance, there are only two types of construction:

First: the streamlined stainless steel with full length pleats.

Second: the stream painted flat sides.

The work necessary to produce a good looking streamlined car is less than that for the old standards. Steps generally fold up out of sight and the apron covers most of the under body details. It is therefor not essential to include these parts, thus the diaphrams are the only intricate detail to be included. These and the roof section may be purchased from the trade. If the roof is purchased, the center height or radius may vary, but due to the angle from which models are seen, this will not matter even though the variation be relatively large.

THE OBSERVATION CAR

Of the several blue observation cars, the old "Royal Blue" and "Columbia" of the B & O seemed the most suitable since the contour of the rear end is generally similar to most all streamline rear ends. These are currently running as "Ann Rutledge" and "Abraham Lincoln" on the Alton.

Before starting to read the drawings, the terms (of dimensions) over buffers, or inside coupler knuckles, mean all of the following:—

—to edge of fixed buffer
—to face of spring buffer or diaphram when coupled
—to pulling face (inside knuckles) of couplers

Edge of fixed buffer or face of spring buffer should be on vertical line from inside coupler knuckle.

Let's start the observation!

Because of the rounded rear end, it may be best to use a separate roof and sub roof. The sub roof and floor can best be made of ¼" plywood with centerlines marked out on bottom of floor and held together with wood screws at truck centers. Mark out the curves at rear end and cut off the front end square. Then cut to curves at rear end. The length should be 17" as the tapered end pieces extend from the bottom of roof to below the floor. Recess front ends so that the vestibule doors will set flush. Plywood spacers should be used for strengthening. Where space between the windows will permit, they should be of ¼" plywood. Due to windows and spacing, a ⅛" spacer is needed toward the rear end. Mine is located as shown in the drawing and the result is a reasonably strong car body.

The roof may be planed and sanded from a fine grained pine or other wood. This will be 17¼" long as it covers the end pieces. Layout from the sub roof and then saw. The wood is then planed and sanded to finish.

A circular saw for straight cuts and a band saw for the curves are very handy, however, with a little care, hand tools will do a good job.

The end pieces can best be made by cutting a strip of fine grained pine ¼" x $1\frac{5}{16}$", then sawing the taper from ¼" to ⅛" thickness at the outside edge. Make enough for all cars not using full width diaphrams. Cut off with a fine tooth saw as needed. Assemble, using cement and brads; first the sub roof to the roof, then the spacers and the floor, then the end pieces. Fit and cement posts between floor and sub roof at sides of the rear door to which the door and the sides may be cemented later.

If the interior is to be fitted, do so now, since due to the curvature, the sides will have to be permanently fastened.

The sides and doors can best be made from cardboard about $\frac{1}{32}$" thick which is generally available from stationary stores. Use sheet metal if you wish, but who wants to cut windows in that stuff ! ! Since the apron on this car is straight vertically, the sides should be made to extend below the floor to include the apron. Lay out on the cardboard both the sides and the three doors. Cut with a new razor blade or model knife guided by a straight edge or steel rule. Cut the doors separately. The windows are cut out with a very sharp wood chisel.

Paint the sides, doors and the end pieces on assembled body a Royal Blue. Paint the roof French Grey. Glaze the windows in the doors by cementing cellu-

loid to the backs over window openings and cement in place on the car body. Cut strips of celluloid full width of side sheets. Cement celluloid to sub roof and floor and cement sides to celluloid, then hold with weights until the cement sets. Do this at one setting to prevent warping in drying.

I can see no reason for using working doors and folding steps, because the time needed would be sufficient to build at least two more cars. Of course if your space is limited and you have room for a few cars only, then the more detail the better.

Any available coupler pocket, that locates the coupler shank against the floor, may be used. Locate so that the inside of the knuckle or pulling face is ¼" out from the end pieces of the car body. The rear coupler should line up with the buffer (end of car floor) but need not be used as it is retractable in the prototype.

It is by no means unorthodox to couple streamlined cars in or to a train of standard equipment. Some modeler has correctly stated there is a prototype for everything and I see trains of mixed equipment every day. Some are wows, even to full width diaphrams on the rear ends.

The trucks may be purchased from the trade. The type known as 4 wheel streamline is proper but not essential. Fit them to the bottom of the car floor using a body bolster of proper thickness to maintain the dimension $1\frac{13}{16}$" from rail to bottom of floor which will give the standard coupler height of ¾" above the rail.

Lettering transfers are available from Walthers for either the B & O or Alton.

THE VISTA DOME

The dome itself calls for some patience but don't let the corrugations scare you off.

The floor and sub roof should be cut together and center lines marked out on bottom of floor. There should be a spacer flush at each end and one near center at a point between windows. Cut out at one end so the doors will set flush. The roof is made in two pieces extending from the dome to the ends of the car. Car ends are left plain and flat to receive full width diaphrams.

Lay out on the cardboard the car sides and dome sides together. The dome top is a separate piece as are the dome ends. The vestibule doors should be ⅛" oversize toward end of car and a ⅛" wide strip provided to represent the car end. Also allow sufficient cardboard to go on over corrugations to take the lettering. Mark out all window openings. Cut to size with sharp razor blade guided by a straight edge or steel rule. Cut out the windows with a sharp wood chisle and gouge. How handy that wood carving set is here!

Paint all these cut outs and the roof with aluminum paint. Use the kind you mix yourself as needed, in which the aluminum is ground very fine so as not to give a grainy finish. When dry, scribe lines as indicated on the drawing using a #2 pencil and keeping the point sharpened. Those corrugations did not come hard, did they?

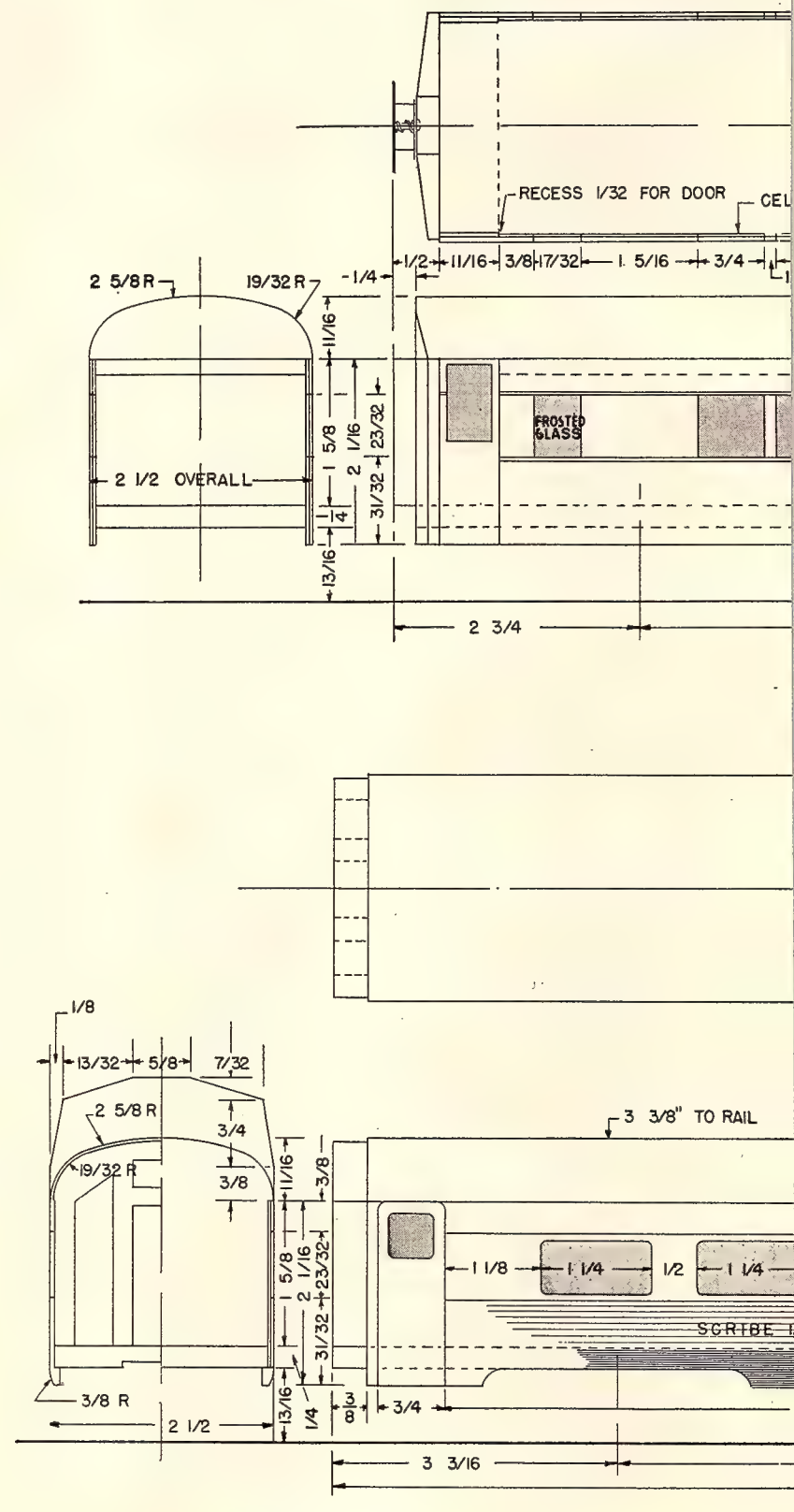
Cut celluloid to lap the window openings in the dome sections by about $\frac{1}{16}$" and cement in place. Likewise, glaze the doors and cement the ⅛" strips at the ends, over the extention of doors.

Cut celluloid for the sides to extend over sub-roof and floor. Cement tissue to inside to cover the frosted windows. Cement celluloid to body and sides to celluloid all in one setting. Weight until set.

Cement a strip of wood to underside of dome top under the solid portion.

Cement dome ends in place using bent strips of tinplate to hold the sides while cement sets. Do likewise with the top. Cement applied to these joints from outside will run into the joint and will not remain as bumps where it shows.

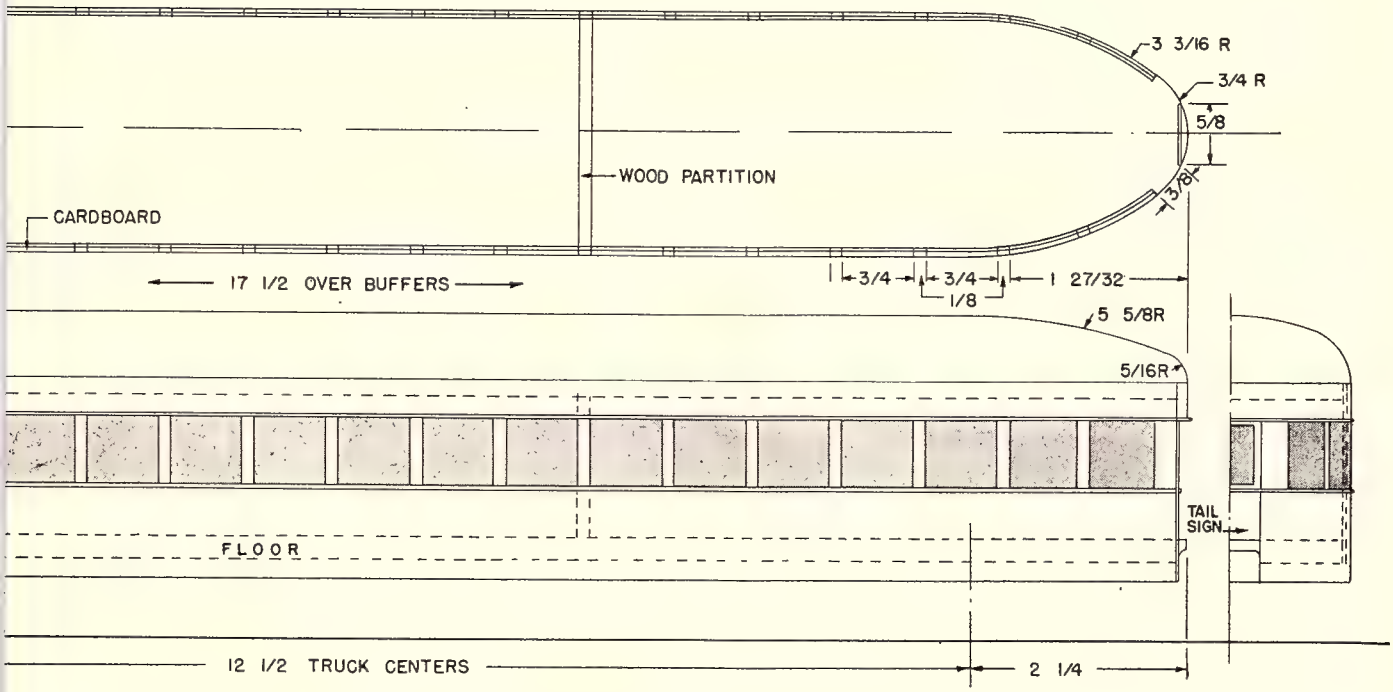
Use a coat of clear varnish on the cardboard for the lettering. Apply the transfers and cut to size. These are then cemented in place.



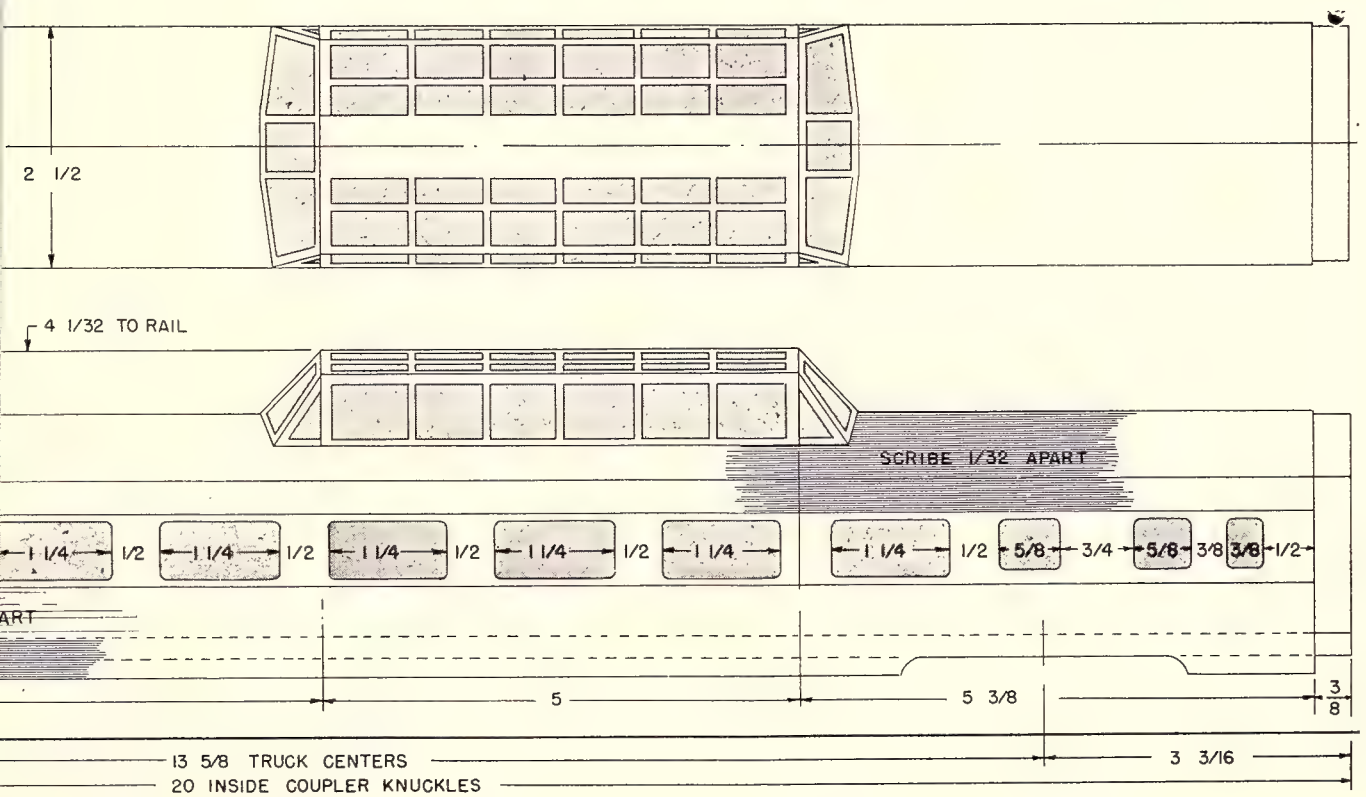
The apron is made from 1/8" x 3/16" pine strip sanded part round and painted aluminum, cut and cement to the bottom edges of car body, flush with the sides. Varnish over all aluminum paint to protect it while in operation.

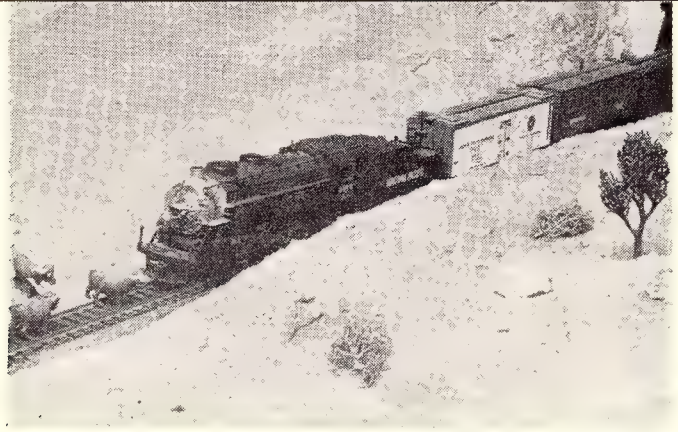
Apply the trucks and the couplers as with observation car. Full width diaphrams are available from the trade or may be made up.

Cut four pieces of cardboard 1/32" smaller than the car end. Cut strips of grey cloth 5/8" wide and cement to the edges of cardboard bellows fashion, with cardboard 3/8" apart. Strikers for this car are cut from tinplate. Set short pieces of 1/8" O.D. brass tube in the car ends. Cut pieces of #42 brass rod and drill through ends for very small escutcheon pins, also through tabs on striker plates. Cement the cardboard bellows to strikers. Cut out the cardboard, bend in tabs and cut the opposite cardboard to admit rods to tubes in car ends, put short lengths of coil spring over rods. (Tire valve or similar light spring.) Cement back cardboards to car ends holding with thin wood strips and compressing springs until cement has set. These will match with standard diaphrams with no trouble.



PLANS SHOWN ONE-HALF SIZE FOR "O" GAUGE



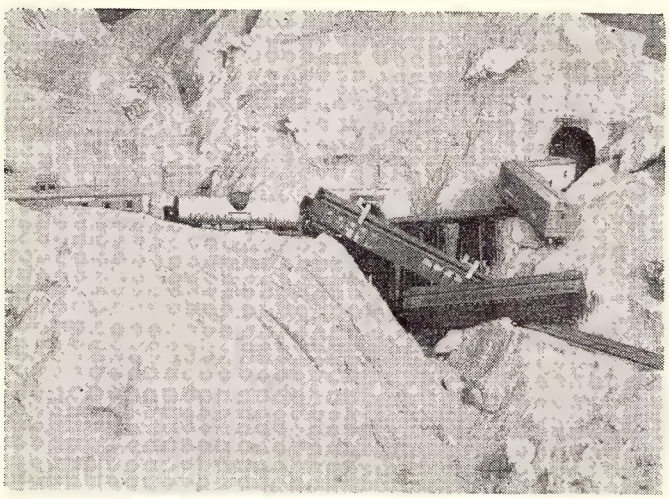


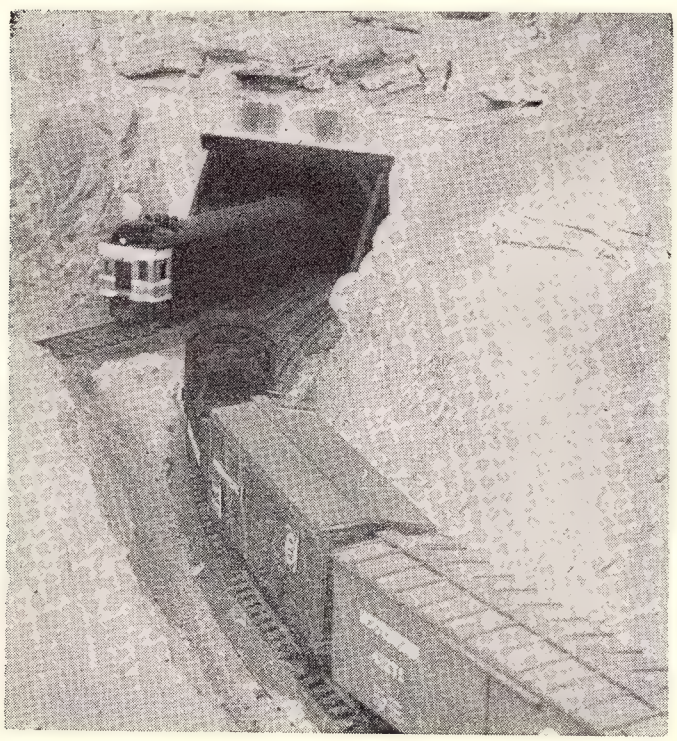
THE Ventura Pacific Lines is a busy HO road built by Merle Weisel which occupies the second story of a two-car garage in Ventura, Calif. Originally this pike was to take only a part of the floor space, the rest was to become an extra guest room—but like *Topsy*— this railroad just grew!

Once the planning stage was completed, construction started by building an open top table. The road sub base was then added, using wood screws for all assembling. This not only resulted in more sturdy construction, but made it possible to accomplish the inevitable changes with a minimum of destruction.

CALIFORNIA PIX STORY

By MERLE WEISEL

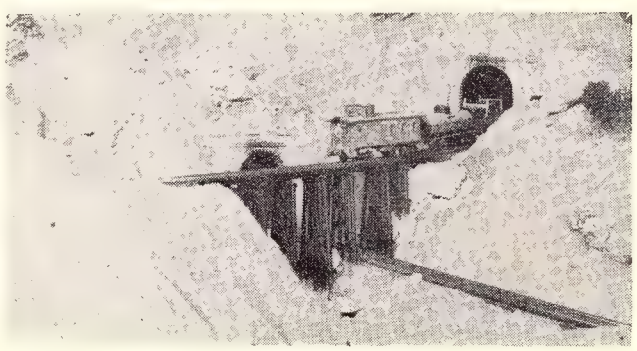


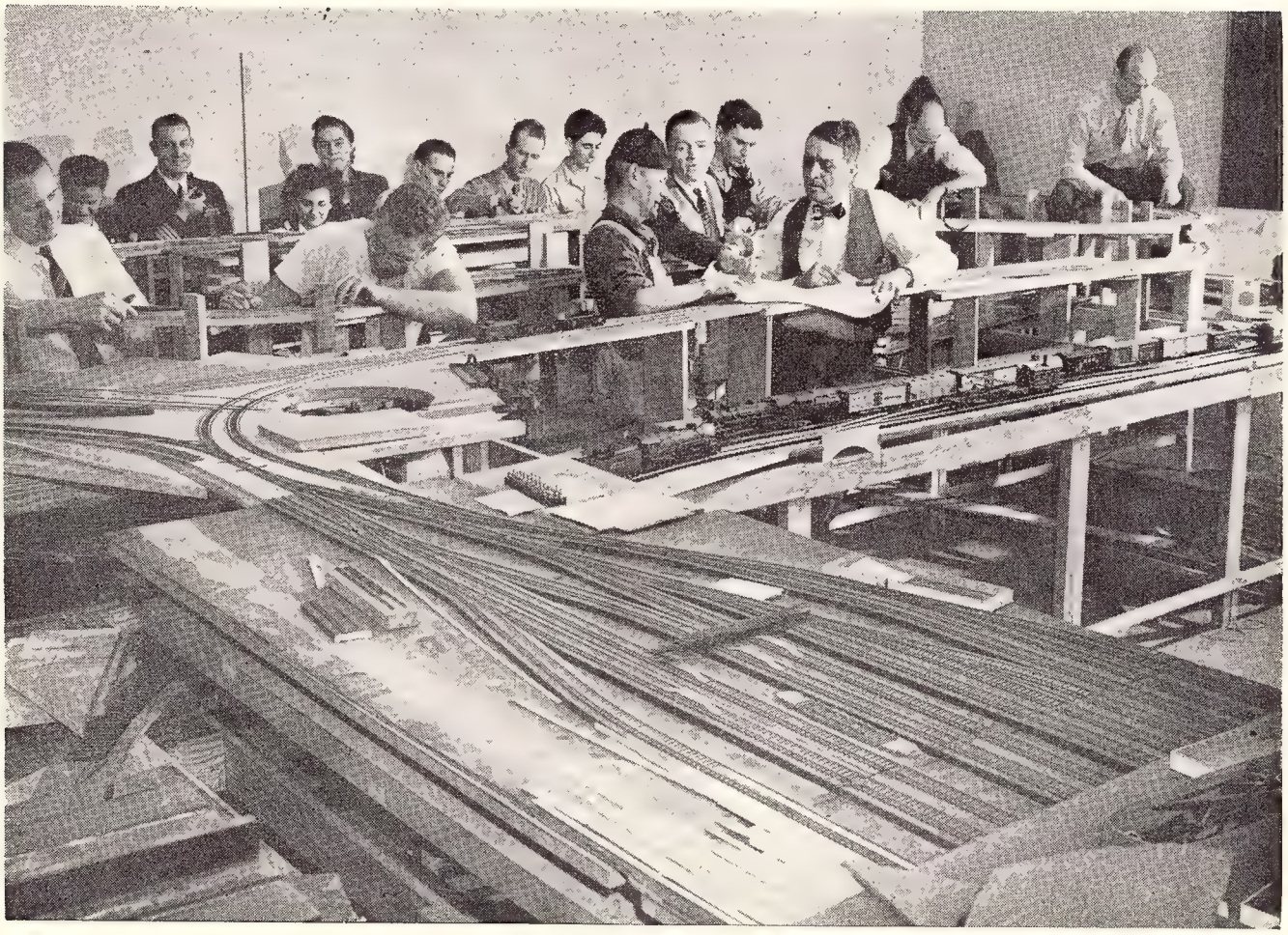


Smooth, dependable operation was the first goal, and every inch of trackwork was thoroughly tested before any scenery projects were begun. It was proven again that carefully laid rail rewards the modeler with many satisfaction-filled hours of operation. It was anticipated that scenery would be the big headache—it turned out to be a real enjoyment. 2 x 4's were used for uprights at the summit and along the ridges of the mountain ranges. 1 x 6's on edge, cut to the desired contour, were fastened to these, both along the ridges and from the ridges down to table top or valley level. Having now the approximate form, this was covered with window screen and the finer details added. Ridges or crevices were *pinched* into the screen as it was tacked into place. It was allowed to sag loosely at some locations and bunch up elsewhere to create slides and embankments.

Plaster was added, using about 1/3 plaster and 2/3 sand. Here the final affect was achieved. Rocks (with due regard to scale) were used to make interesting scenery together with rotted red wood. Set into the plaster properly, this wood has the appearance of rock eroded by the elements. Painting then produced a satisfying reward for the tedius labor involved. Various shades of browns and greens with judicious use of yellow, gray, black and red created a very realistic landscape —these paints were flat pure colors mixed with water. Water-mix colors are simple to apply and blend nicely. A very thin black "Wash" over the entire scene gave it a dull *aged* appearance.

The finished product presents a true-to-life miniature picture of the surrounding California landscape. Even a professional could be proud of this pike—another example of care and patience paying off!





New Washington Layout

By H. A. McBRIDE

THE Metropolitan Society of Model Engineers at Washington, D. C. holds the charter for three railroads—the Metropolitan Southern (O-Gauge), the Metropolitan Eastern (HO-Gauge), and an interurban connecting Crown Point, the principal city in the area, with the industrial town of Stone Haven.

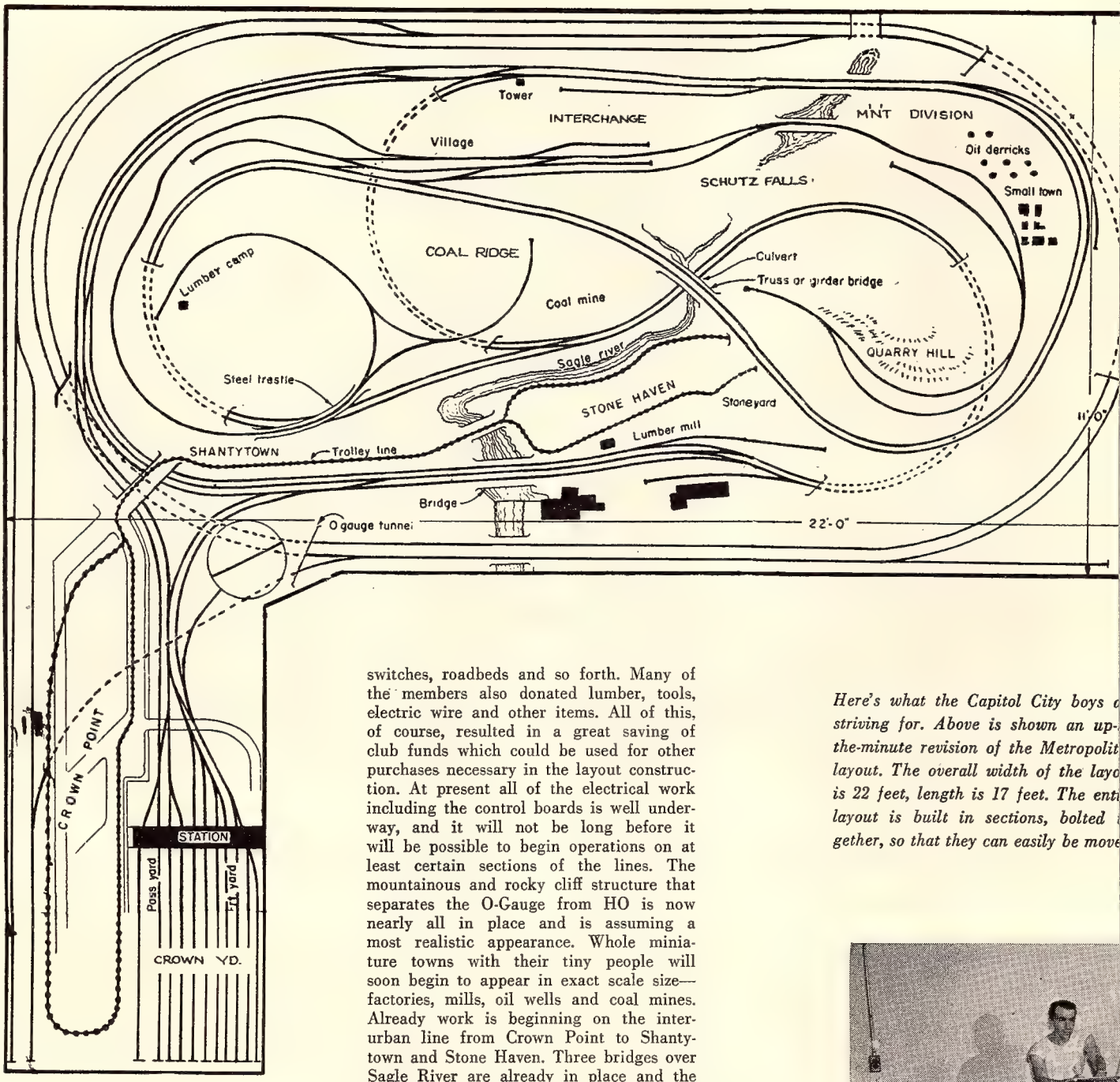
The war caused a complete loss of right-of way, bankruptcy, abandoning of lines, sale or scrapping of equipment, economic distress and similar woes familiar in railroad history. Last May, however, the sky suddenly brightened and the sun burst forth. Through the good offices of the manager of the Washington Terminal Company, Mr. B. R. Tolson, Room 457 in the Union Station at Washington was made available to the club. This is an L-shaped room about 23 feet along one side and 17 feet along the other and makes a suitable and most appropriate location for the model roads.

The boys got out the still-valid charters and dusted them off. Through the hot summer months there was great activity in the planning department. First mere sketches were considered, revised and finally adopted; then came more careful drawings and at last a definite blueprint to exact scale showing all tracks, switches, radius of curves, yards and the location of towns, industries, mountains and rivers. At the same time the final plan was submitted to the entire membership for its approval before accepting it.

Work on the understructure started in July, 1947. The base height from the floor was established at 36" and open-top structure was closely followed. All of the understructure was built in unit sections about 3' x 5' in size, each having strong cross supports and using 2 x 2 uprights for legs. This idea of building the understructure in separate units was thought advisable in order to facilitate any future moves of the layout if that unhappy event should ever transpire. Erected separately, each unit was then bolted firmly to its neighbor, and the result was a very firm and solid foundation. All of this part of the work was put together with screws, no nails being used. The roadbed uprights were also fastened together with screws as were the roadbed support boards (¾" seasoned pine).

As will be noted from the track diagram, there will be an O-gauge line—the Metropolitan Southern Railway—which will have some 175' of track with 19 switches, all handlaid on wooden ties. Practically all of the O-Gauge track is already in place and final wiring construction of control boards is nearing completion.

The HO-Gauge—Metropolitan Eastern Railroad—is also near completion insofar as track work is concerned. The HO-Gauge is set back of, and about 12" above, the O-Gauge line and it is felt that this arrangement will give an unusually realistic effect to the whole layout. The main stem of the Metropolitan Eastern which winds through hilly country and industrial centers, has grades up to 1½% and 30" minimum radius curves. A branch line, the mountain division, has 20" minimum curves and grades as steep as 2%. Headquarters and main terminal of both lines will be at Crown Point and one of the main features in the HO-Gauge is Crown Yard—an eleven-track passenger and freight yard



with fourteen switches and a three-track throat. This is named for Mr. John W. Crown, Jr., who generously presented this fine piece of model railroad trackage to the club. The terminal passenger station will be located over this yard and will serve the city which parallels it.

The HO-Gauge system will have some 230′ of main line track, 48′ of mountain division, 120′ of spurs, interchange, and yard tracks and fifty-two switches.

Soon after construction was initiated, the club was surprised and delighted at the great interest which was taken therein by Washington model dealers. Phil Corr of the National Hobby Supply, George Parezo of the Superior Lock and Electric Company, and W. E. Barton of the Hobby Center were among those who gave to the club valuable gifts of materials, rails, switches, roadbeds and so forth. Many of the members also donated lumber, tools, electric wire and other items. All of this, of course, resulted in a great saving of club funds which could be used for other purchases necessary in the layout construction. At present all of the electrical work including the control boards is well underway, and it will not be long before it will be possible to begin operations on at least certain sections of the lines. The mountainous and rocky cliff structure that separates the O-Gauge from HO is now nearly all in place and is assuming a most realistic appearance. Whole miniature towns with their tiny people will soon begin to appear in exact scale size—factories, mills, oil wells and coal mines. Already work is beginning on the interurban line from Crown Point to Shantytown and Stone Haven. Three bridges over Sagle River are already in place and the highway overpass near Crown Point is completed. The construction office of the O-Gauge line at Interchange has been in place for some time and is a scene of busy activity.

All operation will be realism personified. Trains will run on two-rail 12 volt D.C. current and will be operated by cab control. There will be two control towers for the O-Gauge and three for the HO. Some of the members are already completing motive power and rolling stock. There will be sleek streamlined "name" trains and a host of the usual box and tank cars, coal hoppers and so forth.

As soon as the two lines are in operation it is expected that the traffic will be unusually heavy. It certainly should be inasmuch as in the Washington Terminal there will be direct connections with the Pennsylvania, Baltimore and Ohio, Richmond Fredericksburg and Potomac, Southern and Chesapeak and Ohio lines!

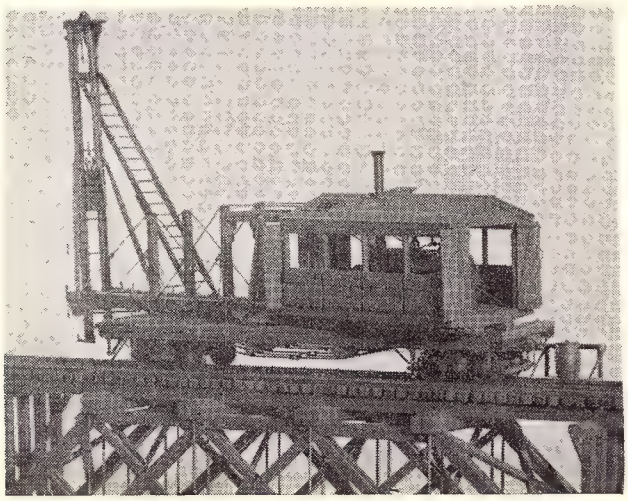
Here's what the Capitol City boys a striving for. Above is shown an up- the-minute revision of the Metropolit layout. The overall width of the layo is 22 feet, length is 17 feet. The enti layout is built in sections, bolted t gether, so that they can easily be move

Building the four gauge lines in the teen track termin same location o

QUIET PLEASE! — Genius at work! A member of the Metropolitan Society of Model Engineers all wrapped up laying HO rail on the mountain division. Note how the scenery is being constructed.

n for one of the most popular HO and O . In the foreground is Crown Yards, a four- e photo on page 25 for another shot of this n a more advanced stage of construction.

Putting the finishing touches on the Metropolitan Society of Model Engineers' layout. On the lower level is the O gauge Metropolitan Southern Railway, the mountain division is the HO Metropolitan Eastern Railroad.



PILE DRIVER CAR

By ALEXANDER F. DALLAS

THIS O gauge model of a pile driver was built after a Chicago & Northwestern car of the 1880's. Detailed plans which first appeared in the 1884 edition of the Car Builder's Cyclopedia were used for basic construction. Additional details for the operating model hoisting engine were obtained from engine and machinery catalogs of the same period. Information regarding the painting and lettering was furnished by the Chicago & Northwestern Railroad.

The model follows the prototype in the use of wood and metal for the various parts. Brass was used almost entirely for the metal details with the exception of the motion work for the steam hoisting engine where nickel silver was used to represent the polished steel of the original. Bass and box wood were used for the timber work while the cab was built up from $\frac{1}{32}$" thick birch aircraft plywood.

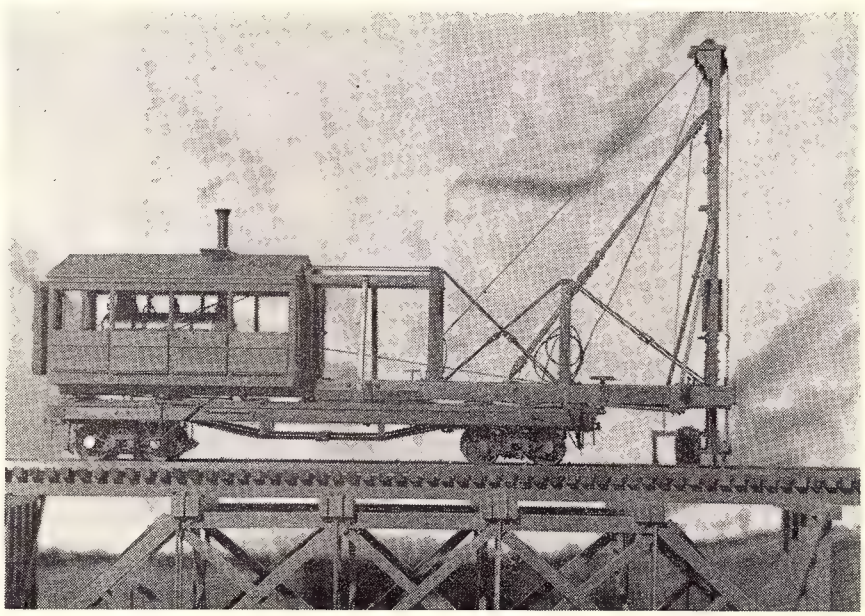
The car body is a heavily built flat car framed with deep longitudinal sills and cross members. This timber framework is reinforced with metal corner plates, cross rods and longitudinal truss rods. There are six of these longitudinal rods made from .038" diameter brass rod threaded .038-140 with threaded turnbuckles at the center and threaded nuts at each end. Several sections of circular track are fastened to the car floor planks. These tracks carry the rollers that support the upper works. The track sections at the ends of the car have hinged extensions which fold up against the side sills when the pile driver is being moved over the road. When the pile driver is working, these extensions can be pulled out to permit the upper works to be swung out over the side of the car for driving piles along side the track. The front end of the car body is curved and fitted with a section of toothed rack. This was formed from $\frac{1}{8}$" square brass rack bent to shape and fastened to the car body with small pins. The draft gear is link and pin, fully sprung.

The trucks are the swing-motion, arch-bar type. The side frames were built up from brass strips, bent and soldered. The journal boxes were filed to shape from square brass bar and fastened to the frames with small pins whose heads were filed square to represent bolts. The frames were connected together with box wood transoms which support the metal hangers for the spring planks and swing motion bolsters. These spring planks and bolsters were also made from box wood, a wood which is very suitable for these small details since it is strong, very fine grained and hard.

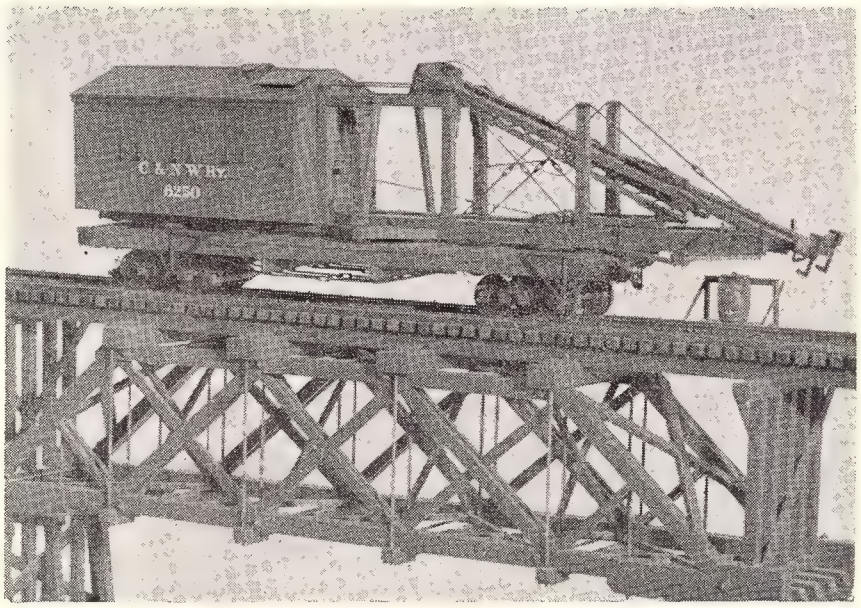
The various small metal details of the trucks were modeled from brass. The trucks are equipped with working springs and the lids of the journal boxes are removable. Oil-soaked cotton is packed in the journal boxes to lubricate the axles. The rear truck is fitted with hand brakes which are operated from a brake wheel mounted on the car body near the center. Small brass chain and wire connect the brake beam levers with the brake wheel staff. The truck running wheels are insulated for two-rail operation.

The main supporting members of the upper works are the two longitudinal timbers of scale 16" x 16" cross section which extend the entire length of the upper works. Cross timbers at the rear end extend out to both sides and support the cab and machinery. The folding pile hammer leads are hinged at the front end. These main timbers are further strengthened by a truss composed of timber posts and rods with threaded turnbuckles similar to the car body truss rods. When the leads which guide the hammer are raised to operating position, they are braced by the folding ladder at the back and by two sloping side braces that are connected at the top to the leads with small pins and at the bottom to a braced platform which extends out from the main timbers. The hoisting line for operating the hammer is carried up between the leads, over a sheave at the top, down the back of the leads, around another sheave between the main timbers and thence, through a slot in the front of the cab, to the main drum of the hoisting engine. An auxiliary line, used to pull the piles into position between the leads, is carried up over a side sheave at the top of the leads, down around a sheave mounted on the outside of the main timber sill and then through the side door of the cab to a spool on the hoisting engine.

The hammer is the free-fall type and was filed to shape from a block of brass. It is lifted by the nippers which are connected to the hoisting line. These nippers have a pair of curved arms extending upward and pivoted near their lower ends. The portions of the arms below the pivot form a pair of hooks that fit into a slot in the top of the hammer. When the nippers are dropped



down on the hammer, the hooks engage a pin in the slot. When the nippers are lifted, the weight of the hammer causes the hooks to tighten around the pin, thus lifting the hammer. Near the top of the leads is a tripping device that forces the curved arms of the nippers together. This action disengages the hooks from the pin and allows the hammer to drop down on the pile. The nippers are then lowered to the top of the hammer and the operation repeated. The hammer leads and ladder are hinged so that they can be folded down when the pile driver is moved over the road. The upper works is connected to the car body by a king pin at the center. Small rollers mounted on the underside of the main timbers roll on the circular track sections fastened to the car floor. These rollers support the weight of the upper works when it is rotated. This rotation is accomplished by turning two hand wheels at the front of the car. Small brass gears on the hand wheel shafts mesh with the curved rack on the car body.

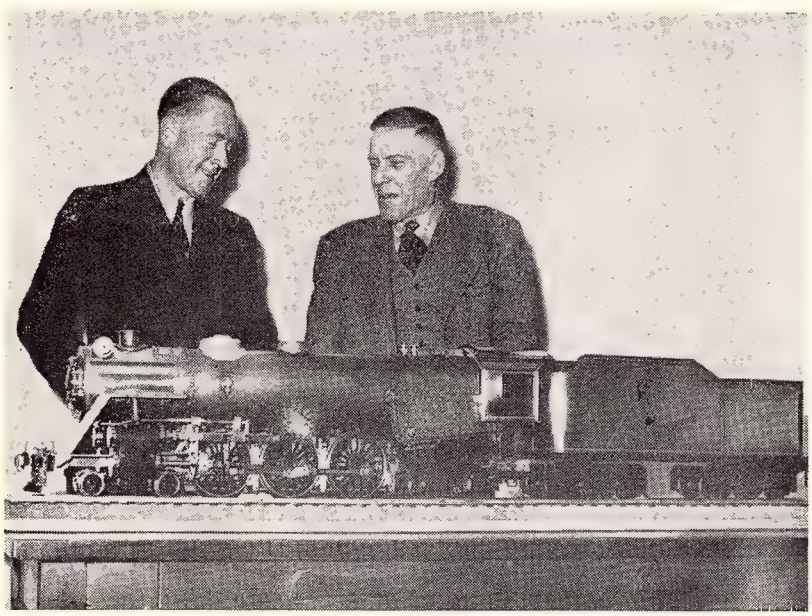


The cab was built up from 1/32" thick plywood reinforced with timber framing inside. The window and door openings were filed to shape and the plywood scribed to represent planking. All the window shutters and doors were fastened to the cab side and ends with working hinges. These hinges were bent to shape from thin brass and fitted with pins cut from fine brass wire. The roof is removable to allow for lifting out the hoisting engine.

The hoisting engine is a complete, separate unit that can be lifted out of the cab as required for oiling and adjustment. A small electric motor, concealed under the dummy steam boiler, drives the mechanism through worm gearing and a train of spur gears. The main drum can be engaged or disengaged by a clutch arrangement operated by a lever at one side of the cab. This drum is also fitted with an operating brake worked by a foot pedal with a spring release. Two flywheels, turned from nickel silver, are mounted on the ends of the main drive shaft. The connecting rods, cross-heads and guides are also modeled from nickel silver.

Full-working Stephenson valve gear is fitted to the engine and driven by eccentrics on the main drive shaft. This gear is reversed by means of a lever that moves a link and causes the valves to be operated by the reverse motion eccentrics. This lever is also connected to a reversing switch for the electric motor so that when the lever is moved to the back gear position, the motor is actually reversed and the drum rotates in the opposite direction. The dummy horizontal boiler was built up from thin brass tubing. The fire box was built up from thin brass sheet and soldered at the boiler tube. The stock is a piece of brass tube, flared out at the top and connected to the smoke box in such a way that it can be removed. A hinged hatch in the roof is provided to allow the stack to extend above the roof when the driver is operating. The fire box door is hinged so that it can be opened and the boiler is fitted with a water gage, steam gage, injector, throttle valve, try cocks, safety valve and whistle.

Artist's oil colors, thinned with turpentine, were used for painting the timber work. These colors dry with a flat, weathered appearance. The inside of the cab was painted a dark green and all exterior surfaces box car red. All the brass details were chemically blackened and touched up with dull black. The metal parts of the trucks are black and the wooden members box car red. The lagging on the boiler was painted with locomotive semi-gloss black and the bands holding the lagging to the boiler are polished brass. The smoke box and fire box were painted dull black as were the engine frames and sills. The main hoisting line and pile snatch line are pieces of fishing line, stained with black india ink diluted in water.



Tim Reardon and P. R. Shaler inspecting Tim's big ¾ inch scale Hudson—a true "Work of Art!" This Hudson has a world of power. She burns coal instead of oil and is expected to haul ten or twelve passengers at a clip!

THE LIVE STEAMER

CHARTER

"A Charter is hereby granted to the Golden Gate Live Steamers to construct and operate a railroad, to be known as the East Bay Regional Park Railroad, for the purpose of hauling passengers from "Terminal" to End O' Track". The line will be of 2½" and 3½" gauge and will operate by live steam exclusively."

The above imaginary charter proclaims to the "live steam" world the beginning of a new era on the West Coast, the goal sought for so long—an outdoor, passenger carrying track. Through the efforts of Frank Dee, the East Bay Regional Park Commission of Alameda, Calif., graciously offered the Golden Gate Live Steamers a site of three or four acres on which to erect a track and in addition, have given the members the use of a large cabin with all facilities. Construction of the track will be started immediately; probably a 100 foot circle just to get going.

DOME CONSTRUCTION

A STORY IN SECTIONS

By HERMAN H. MITCHELL

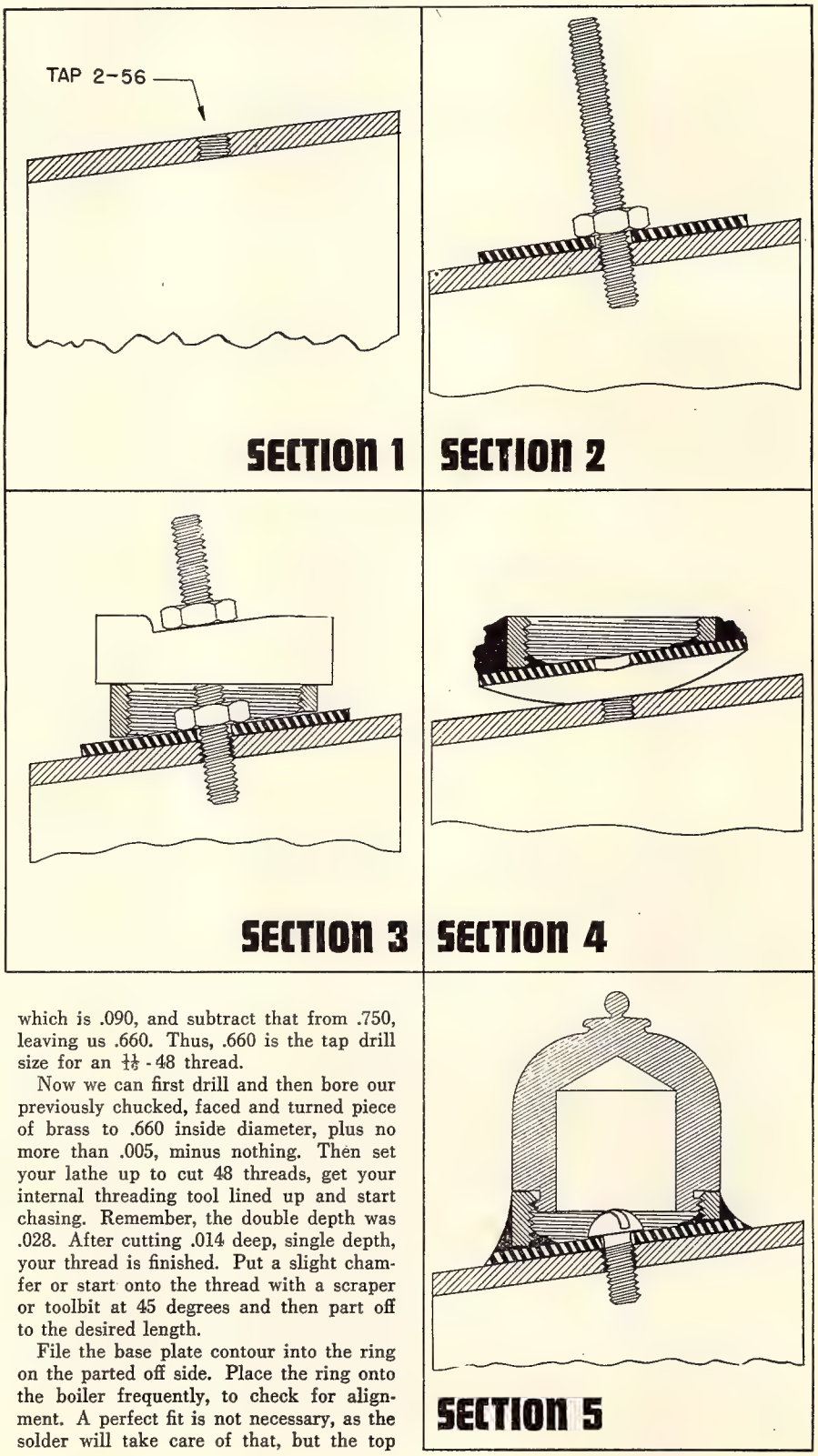
THE accompanying drawings show a method of dome construction for O gauge or the larger gauges, that should appeal to the model machinist. Certain advantages of this method are very evident, one is the invisible, solderless mounting of the dome or domes and stack to the boiler. Although a tapered boiler section is shown, the same method may apply to a straight section and the stack as well. Where it is necessary to cut down on the weight, the domes and stack may be made from aluminum or plastic. One of the greatest advantages of this method however, is the possibility of changing the entire silhouette of your locomotive by substituting one set of domes and stack for another. For example, an engine of 1900 vintage may become a little more modern in a matter of minutes by simply unscrewing the somewhat high and unstreamlined looking domes and stack and replacing them with lower ones. Here is an ideal way to amaze your visitors on operating night!

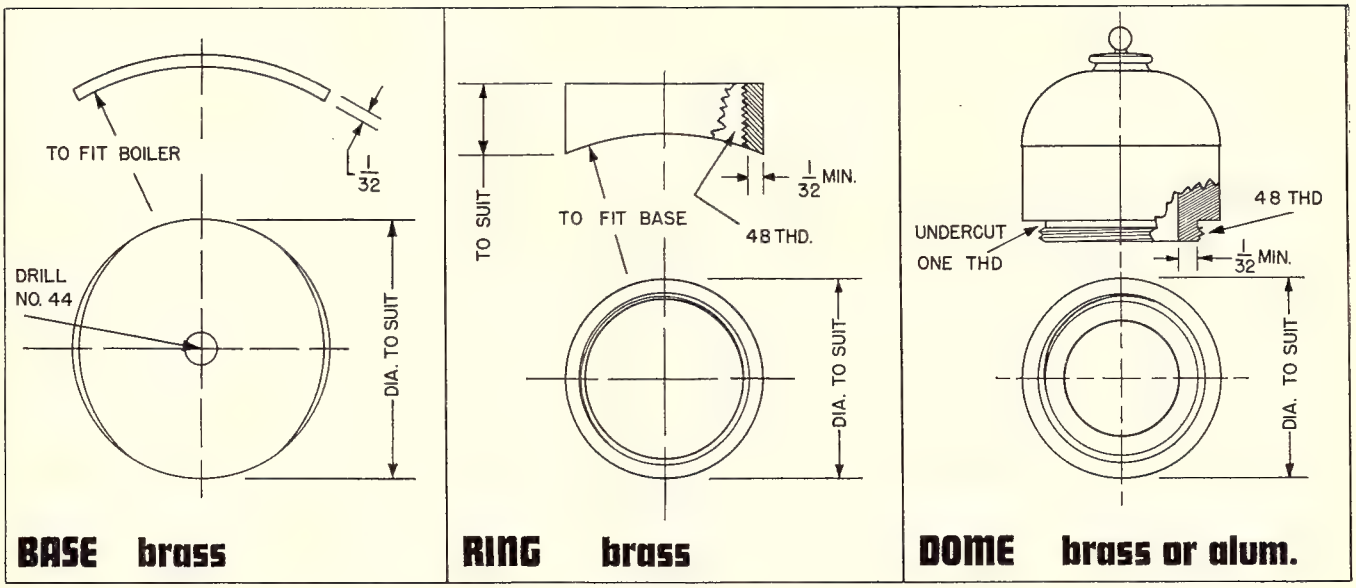
To start, lay out, centerpunch, drill and tap number 2-56 the dome and stack centers on your engine's boiler as shown in Section No. 1. I have chosen the tapered boiler section for an illustration because it is usually the hardest one on which to install domes. Next, on a piece of 1/32 inch brass sheet, lay out with your dividers a circle of the required base diameter of the dome and drill a number 44 hole in the center. Cut the circle from the sheet and file to size or set up in your lathe on a 2-56 screw and turn to size. If you have some thinner gauge brass or copper sheet stock in your stockpile, use that in preference to the 1/32 inch as it is much easier to form to the boiler contour. The stock however, should not be less than .010 thick. Bend the stock with your fingers until it fits the boiler nicely, or better yet, give it a little spring and let the screw pull it down to fit. In Section No. 2 we see this dome base held down in place with a temporary nut on a 2-56 stud.

Next, we machine the dome base ring from a piece of oversize brass stock. Turn the outside diameter to the size required for your engine. The outside diameter of this ring equals the outside diameter of the finished dome as can easily be seen in Section No. 5. Face off the front. Do not break the corner between diameter and face however, as the finished dome will appear to have a groove near its base. Next, select the proper diameter for the 48 threads. As indicated, minimum wall thickness should be 1/32 inch. Let's take an easy example: say the dome diameter is 3/4 inch or .750. Two minimum wall thicknesses are .062 and the double depth of 48 threads is .028. We add .062 and .028, which is .090, and subtract that from .750, leaving us .660. Thus, .660 is the tap drill size for an 1/16 - 48 thread.

Now we can first drill and then bore our previously chucked, faced and turned piece of brass to .660 inside diameter, plus no more than .005, minus nothing. Then set your lathe up to cut 48 threads, get your internal threading tool lined up and start chasing. Remember, the double depth was .028. After cutting .014 deep, single depth, your thread is finished. Put a slight chamfer or start onto the thread with a scraper or toolbit at 45 degrees and then part off to the desired length.

File the base plate contour into the ring on the parted off side. Place the ring onto the boiler frequently, to check for alignment. A perfect fit is not necessary, as the solder will take care of that, but the top





of the ring should be level with the centerlines of the boiler, both ways. Turning to Section No. 3, we see the ring being held onto the base plate by a block clamp, wood or metal, preferably not brass as you might solder the ring to the block. If the boiler is brass, and most of them are, it is wise to apply a coat of oil or grease to the spot where the dome fits to prevent the base plate from sticking permanently. Now flow an ample supply of solder all around the assembly and let it cool off. Remove the nuts, block and stud and finally the dome base assembly. Note the amount of solder shown in black in Section No. 4.

The next job is somewhat nasty, inasmuch as it requires handwork. First, with a coarse file, then with a scraper and finally with emery cloth, the excess solder is removed until beautifully blending radii are obtained all around. That sounds harder than it actually is, you'll have to try it to find out. You might also find one or more airholes in the solder. Fill them up carefully with more solder or if you are afraid to melt the whole thing, put in some paint filler, wax or chewing gum. After a coat of paint, you won't notice it. Wash the base assembly in alcohol to prevent future corrosion.

Now to make the dome — select the material, either brass, aluminum or maybe black bakelite. Turn a step into it, about ¼ inch long, remembering that our thread was $\frac{11}{16}$ - 48, so the step diameter will be .688 plus nothing, minus not more than .005. Select a threading tool that will cut close to the shoulder and proceed with the threading.

The finished dome base is now utilized as a ring gauge. Cut the threads deep enough to make for a fairly loose fit. Next, face off the threaded portion, until the base can be screwed on all the way. That may leave you with only two or three threads, fully enough to hold. If you wish to provide a lightening hole in the dome, as in the drawing, do it now. Be careful that the hole does not get to deep. It is best to lay out a section of the dome you are modelling, about four times the size and scale the depth of the hole from that. In any case, you must provide a cavity in the dome bottom large enough to clear the 2-56 screw head. The dome is then machined in the same chucking. Part of the crown may be turned and filed to shape, but for the finishing touches, it becomes necessary to hold the dome the other way around. When you think you can't do any more from this side, part off and re-chuck the dome by it's base end, but *not* by the threads. Of course you also left a sharp corner between the outside diameter and the undercut face for a flush fit with the base. You might quickly turn a spud arbor and push the dome onto that for finishing or if you make a small quantity of domes, it may pay to thread another ring. Screw the domes in there and only remove the ring from the chuck after you are all done.

Finally, Section No. 5 shows the finished assembly mounted to the boiler with a number 2-56 screw. Oh yes, another use for this type of dome — you can hide that *occasional* surplus Ten Dollar Bill inside! Just roll it up neatly, it will fit and what's more, the wife will never find it!

DID YOU KNOW?

That before painting on metal, you should wipe it with vinegar to make the paint grip the metal?

That if you hold a spray gun close to the object, it will give a glossy finish and the further away you spray, the duller the finish?

That most models are failures because the builder is too anxious to finish the last stages in a hurry? That it is best to put the model on the shelf until you are in a mood to exercise patience with the final stages of construction?

That old dry cells can be rejuvenated by drilling holes through the zinc casing and immersing the cell in a solution of sal-ammoniac (ammonium chloride) and water for a few hours? (The holes may afterwards be plugged up.)

That the power of a relay or other magnet, having no iron return yoke, can be about doubled by providing such a yoke?

That tools and other metal objects may be etched electrically by connecting the object to one side of a current supply and a metal stylus to the other?

That running an additional "feed wire" to that distant hump on your model railroad layout may permit that train to climb the grade?

That most soldering jobs are spoiled because of too much solder and too little flux?

That sometimes ballast, which often contains a metallic substance, will cause a short-circuit if allowed to accumulate between rail joint and switches?

That for double the voltage, a wire of one-half the cross-sectional area in circular mils (wire 3 sizes smaller) should be used in rewinding coils? (With twice the number of turns of the smaller wire.)

That cleanliness is one of the best assurances of a smooth running gas motor?

That when you tack on car sides, you should start from the middle and work out to both ends to prevent buckling?

That grease and dirt are the worst enemies of any electrical connection?

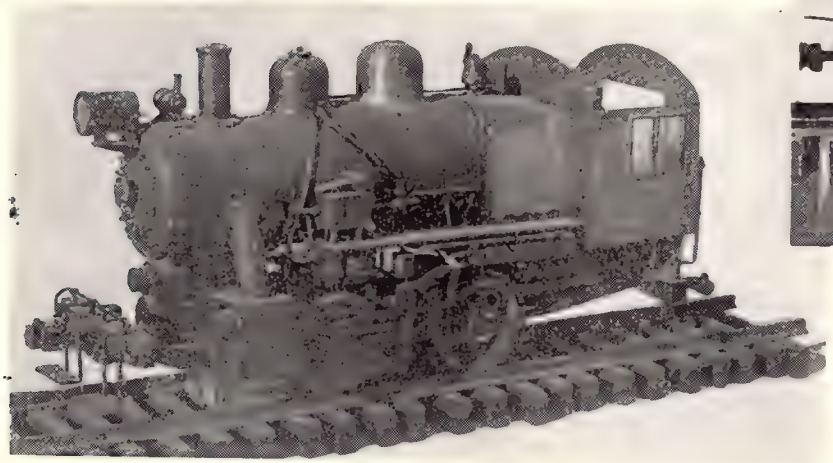
That every electrical connection should be soldered in order to obtain the maximum of efficiency in current conduction?

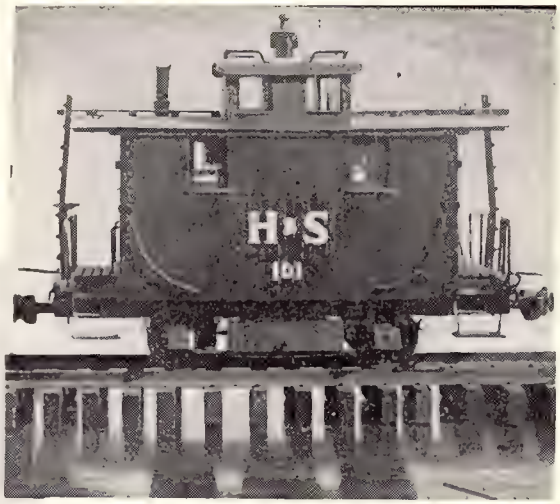
That pilot trucks cause more derailments than anything else and that they can be fixed slightly *above* the track to eliminate the trouble without it being noticeable that they are not rolling on the track?

That all *dope* should be tested for quality and performance before you use it on your model?

That rubber bands operate more efficiently than springs in some instances?

An 0-4-0 switcher in the making! This ½" scale model will be powered by at least two O gauge motors mounted in the tender. The power will be transmitted by a flexible shaft to a husky flywheel which is partly visible in the picture just under the cab. The model was built by Herman Mitchell of Bayville, N. Y.

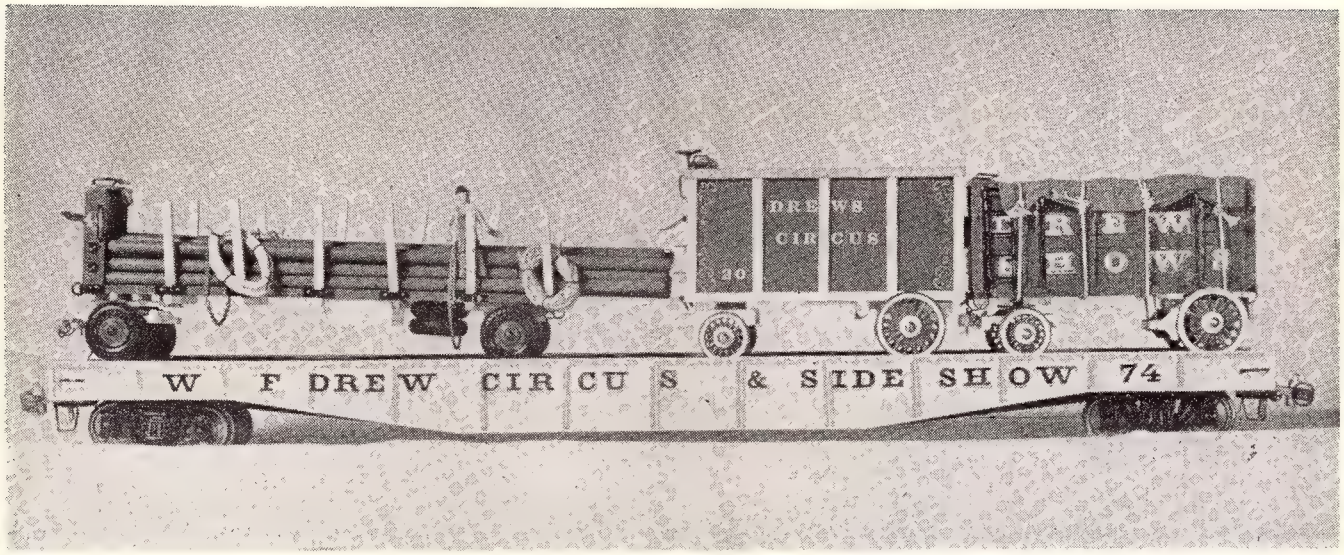




Another model by Mitchell, also in ½" scale. The underframe of this four-wheel caboose, with sprung journals, was built up from brass and the body from wood, stick-by-stick. The interior is complete and windows and doors may be opened. Two flashlight cells inside the toolbox furnish power for the lights. By closing the toolbox door tightly, contact is made and the light go on.

HO yard scene made up of Marklin rolling stock and track. 0-4-0 tank engine shunting cars in foreground—to the rear, we see a semi-streamlined express loco and on the track next to it an electric type. The electric loco is drawing its power from the overhead trolley through its two working pantagraphs.

O gauge model of a Sacramento Northern Local Car. This model was built from brass, oak and pine, including temporary wooden trucks by W. C. Hoffman, San Francisco, Cal. It is built as a Dummy motor car that is run in conjunction with a motorized power car. Poles collect from wire and are connected to spring buffer plates allowing the car to appear as a motor car when train is running.

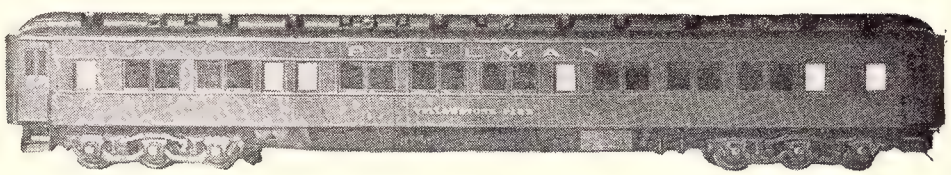


The circus is coming to town! This O gauge flat car, completely loaded, was built by Warren Drew of Minneapolis, Minn., photo by Bob Kruse.

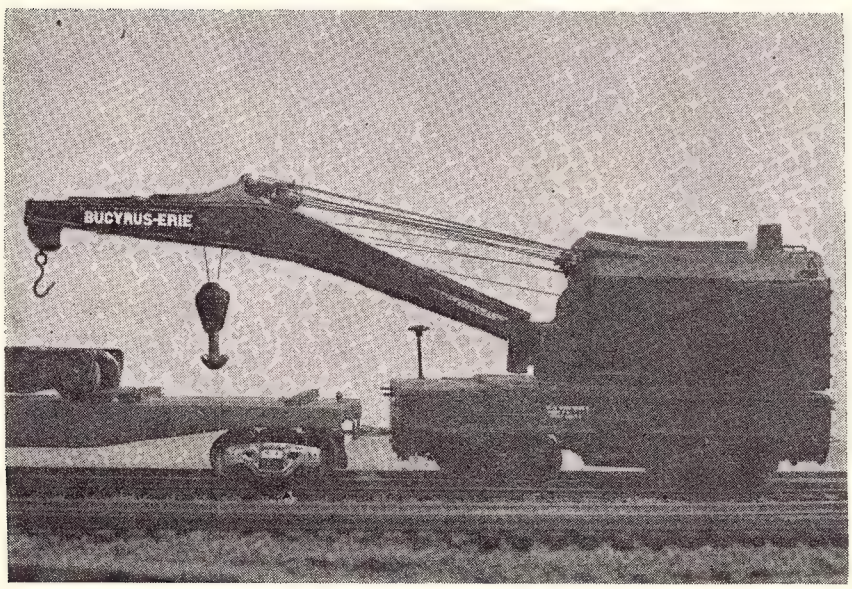
WANT THREE BUCKS?

That's what we're paying for both photo and appropriate caption appearing on this page. Two bucks for each photo without caption. Here's a good chance to let your "nabor" see your work and make some easy money in the bargain. Photos are selected on a basis of good photography and reader interest. We do not limit you to some super-detailed model, so don't be bashful—your photo may be the next to appear on this page. Include all pertinent information regarding scale, gauge and all interesting facts. Send to Picture Editor, Model Craftsman, Ramsey, N. J. Photos returned on request.

YOUR NABOR'S PIKE



Highly detailed O gauge Pullman car built by Alex Galka of New York City. This model, patterned after the New York Central, was built up from scrap parts.



Here's a piece of maintenance-of-way equipment which is proving indispensible to the D & H Railroad. As the line is still in neophyte stage, this 150 ton crane comes in handy laying heavy switch frogs, constructing bridges, and, as none of us are perfect, re-railing wrecks. The crane was constructed by George Leeds, photo by Herb Edgar.

ONCE UPON A RAIL

The Governor Corbett

By JAMES D. HALL

RAIL fans, many times in the long ago, protested vainly about the iniquitous substitution of electric trolleys for the chuffing steam dummies. They argued, (as their sons and grandsons have tried to forstall the coming of the buses) that the new-fangled contraptions couldn't make the grades, nor haul the payloads that their favorites did, with ease.

"Cheaper! Safer, too!" they said, but the electric trolley clanged along and mowed 'em down.

The Steam Dummy, from its very beginnings, fought a losing but ever valiant fight against extinction. Way back in 1873 the Scientific American went to bat for the Steam Dummies when Brooklyn surface car operators were all for switching back to dobbin power.

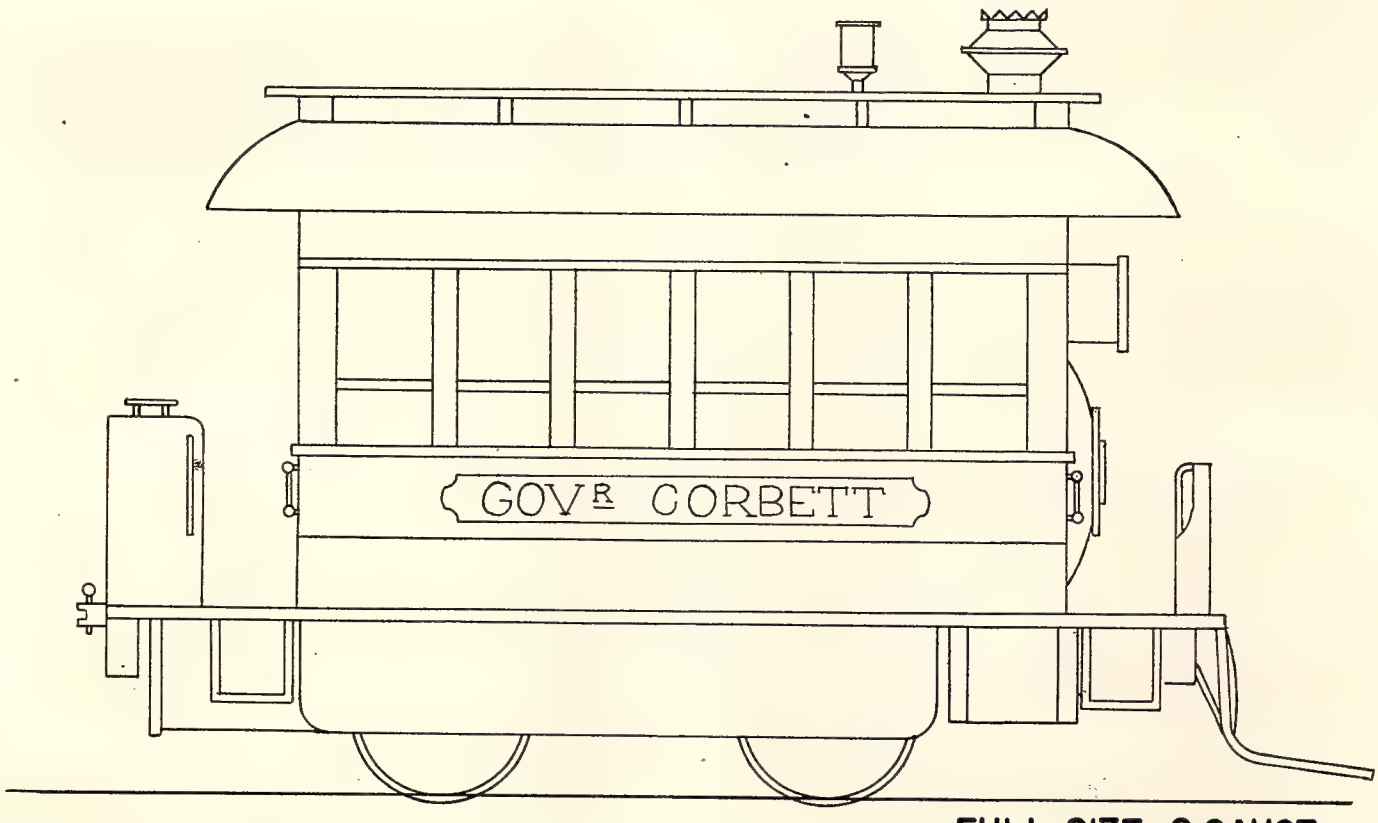
"Greater economies," shrilled the magnates, "More frequent service" (yeah, the gag is *that* old!) "—freedom from smoke and sparks, and far less danger to pedestrians and carriages."

But, the Scientific American (June 21, 1873 and following issues) thought otherwise, advising both public and the operators to reconsider "the dubious economies." Truly, you couldn't send a steam engine back on the road on half rations, and it was admitted that steam dummy operation could not be turned over to an up-state farm boy who could be hired for $1.15 a day; but there was no getting around it, the steam engine was the most efficient prime mover of the day and "is by far superior to either the omnibus or the horse car. The Brooklyn steam cars," observed the Scientific American, "develop *five horsepower* consuming only one "tun" of coal for every thousand miles of continuous run."

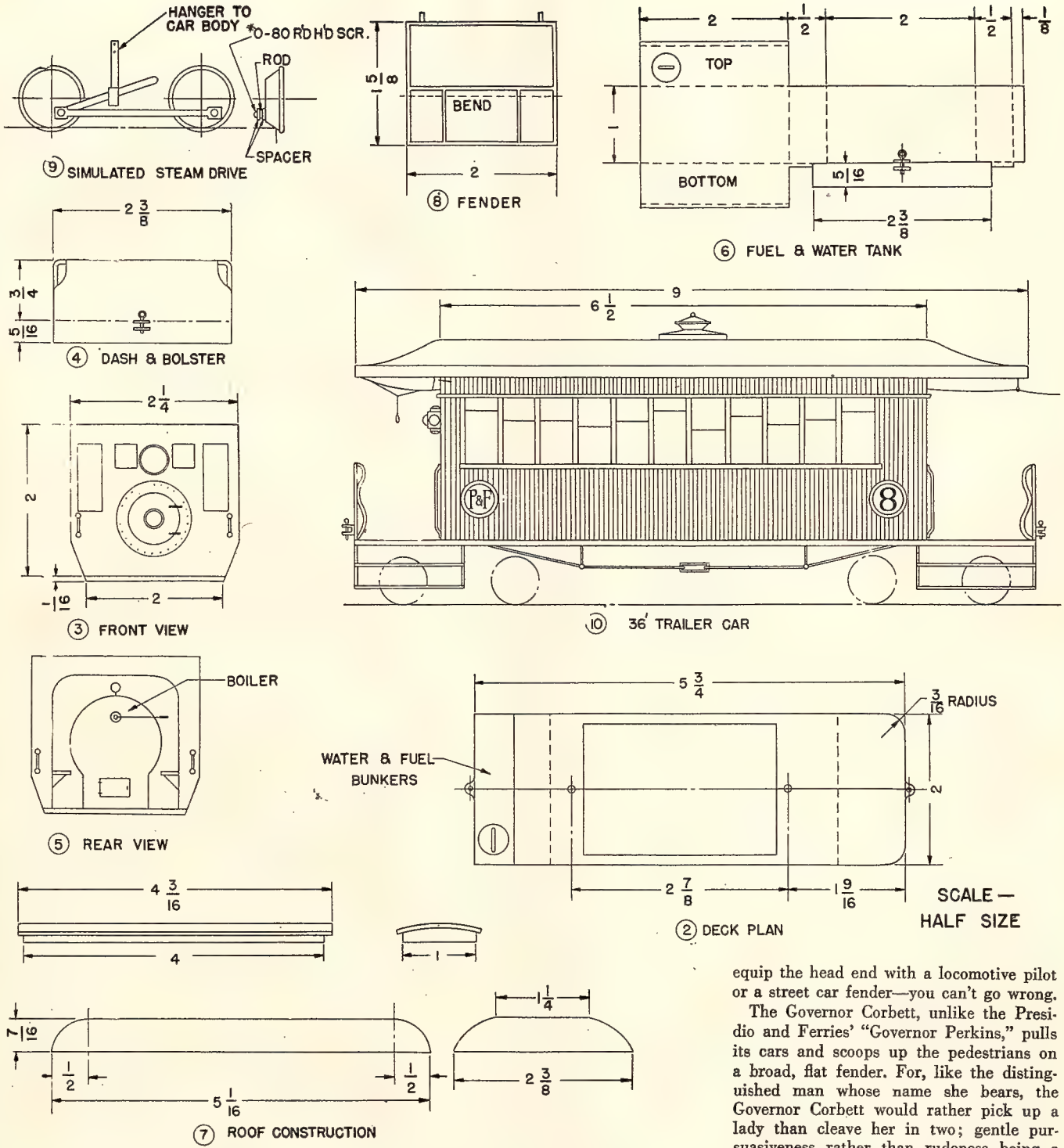
With coal selling from $4.50 to $10.00 a "tun," in those days, the steam dummies operated on a fuel cost ranging from half to one cent a mile!

But, there were disadvantages too, and in 1884 we find Harpers' Bazaar needling the soft-coal burners. A big New York mercantile firm hauled the railway company into court for the destruction of window awnings by fires kindled from the cinder laden smoke of passing locomotives. The attorneys for the defense must have been hard pressed, for they argued—"The upsweep of warm air from the engines are of inestimable worth to the City, in that the rising draughts provide a healthful circulation of air not otherwise to be had in crowded city streets."

Harpers' disagreed—but violently. But, the steam cars puffed along and the Com-



FULL SIZE O GAUGE



pany continued to shell out money for burned awnings, charred toppers and wig blazes.

Law suits, horse-cars, cable-cars and trolleys worked collective havoc on the efficient but objectionable steam dummies; but their ability to survive was commendable indeed. An unverified report has it that Baldwin steam dummies are *still* in street passenger service in New Zealand. As recently as 1936 a "steam tram" very much like our "Governor Corbett" operated between Kogarah and Sandringham, near Sydney, Australia.

San Franciscans who can remember back thirty-five years recall the "Presidio & Ferries" steam line and the "Harbor View Line" that ran from Union Street to the Marina breakwater. Further back in time, there was "The Muncie Street Railway" steam line in Indiana. And sixty-odd years ago, "The Mules' Relief" rattled the window panes through the rip-snortin' town of Austin, Nevada.

The Baldwin Locomotive works turned out the biggest and most up to date jobs, and these seem to turn up most frequently in picture collections. So, we have chosen a Baldwin as the representative of the type. Mason, Grant, Porter and Godwin turned out their share of "enclosed steam locomotives;" the Grant works producing the Dummies used on the New York City "Metropolitan Elevated Railroad" in 1877.

Here's a type well worth including in your stud of iron horses. There's lots of latitude in operation too, and whether you choose to push your cars or tow them—equip the head end with a locomotive pilot or a street car fender—you can't go wrong.

The Governor Corbett, unlike the Presidio and Ferries' "Governor Perkins," pulls its cars and scoops up the pedestrians on a broad, flat fender. For, like the distinguished man whose name she bears, the Governor Corbett would rather pick up a lady than cleave her in two; gentle pursuasiveness rather than rudeness being a characteristic of both the Dummy and its Patron.

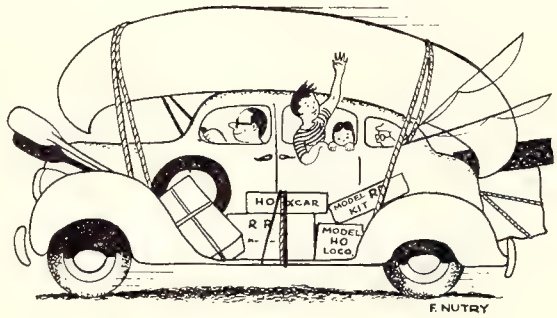
Like the other cars appearing in this series, the Governor Corbett is made to operate on a power truck that serves several bodies. With the protective skirts hiding the greater portion of the wheels, it is hardly necessary to add rod and valve motion. However, if your motor unit has inside frames, it would be a fairly easy job to add rod motion as suggested in figure 9.

The base of the steam dummy (Figure 2) is made from ¼" ply or masonite, and the car ends (Figures 3 and 5) are set down in the slots indicated by the dotted lines in the deck plan drawing.

The front end of the car receives prime attention, using standard locomotive parts

(*Continued on page 41*)

THAT MODEL VACATION



Vacationists Take Note !

By E. A. KIICK

KITS for the vacationist? A wonderful idea! I, as a small hobby dealer, have already taken steps to prepare just that! Few hobbyists realize that a hobby shop's existence during the summer months, even at its best, is none too good. I know of a good many dealers who practically close their doors in vacation time, a great many more who do close and work at something entirely foreign to hobbies while the enthusiasts are on their vacations.

I, for one, am planning to stay open! Possibly my own situation is a bit more advantageous than the rest. You see, last fall I moved into my present location, which is conveniently located in a resort town near to San Francisco. My major business is publicity photography, the hobby shop being a sideline expertly managed by the wife. Conversely though, this summer the hobby business, with new ideas and plans, promises to come into its own. And, with it, my more undivided attention.

The April issue of Model Craftsman played a most important part in these ideas. In that copy was an enlightening article by Alfred Washburn called "That Model Vacation." I'll admit, upon reading skimmingly over it, it left me cold. However, as the ideas began to soak in, I realized that here was something holding great possibilities. Thank you, Mr. Washburn, for your suggestions. And with my thanks, may I hope that other dealers read your article with a resultant move toward these same ends.

My plans for the summer? Model railroading plays the outstanding role. We will have an operating layout in our front window. My own secret dream has been along those lines, and I've built a large array of rolling stock, buildings and equipment. With three locos, some fifty odd freight and passenger cars plus bridges, towers, signals, roundhouse, coaling stations and twenty-five or thirty miscellaneous buildings, all constructed in the past two years—but never a layout—we feel this display will be impressive. The layout is all planned. With some fast, but precise, construction we hope to get the redballs rolling in jig time.

Model kits and supplies take up the largest amount of space in the shop, a goodly portion of it railroading. However, inasmuch as our town's feature attraction is a huge outdoor swimming pool (it's a dammed section of a river), we intend to increase the stock of model boats, seaplanes, etc., carrying the necessary supplies to add to the kits in making even the smallest of them float right side up. Kits of boats will be sold either with or without extras, such as leaded keels to add on, waterproofing varnish and paints, etc.

An advantage to our location is the fact that residents of San Francisco, Oakland and such have summer cabins here where they come to spend the entire summer. The major attractions of our valley, as a whole, are the Redwood trees. Picture, if you will, a model rail (of which those big cities are full) sitting under a majestic Redwood tree or on his Redwood-logged porch whiling away dreamy summer days building new rolling stock for next winter's operation in the city basement. Whether or not he plans to bring kits or equipment with him, as Alfred Washburn pointed out, he will have either of these needs available to him close at hand. Then, if he should run out of that quickly-disappearing cement or wear out one of the paint brushes, he may replenish supplies on that casual walk down to the village for mail or necessary groceries.

We stock all leading brands of railroad equipment in O and HO gauges with odd bits here and there in the other gauges. With such fine distributors in San Francisco, seventy miles away, it is only a matter of a few days to have delivery on most any item not in our stock. We find that being model rails ourselves makes for much better relationship with our customers. It's the old story, too, of a small, compact shop with a good assortment of selections. Hard-to-get small tools, the Vacationists Kits (as mentioned before), and all the latest model magazines *and books*, round out the ideal hobby spot for any vacationland under this new plan.

Concerning the Model Railroad Vacation Club, as recommended by our Mr. Washburn, we had already formulated such plans. A number of permanent residents of us, who are rails, have been meeting through the winter with no definite organization into a club. The main reason for this was the complete absence of layouts in any of our homes with which to operate—and the constant necessity, during this particular past winter, of concentration being centered on making our own businesses pay during off-season months. However, it has now come to the point where we plan to build a club layout—and to offer temporary memberships, in the club which we are forming, to vacationing rails.

Our valley has interesting prototype details for those interested in model railroading. There is a branch line feeding the numerous gravel quarries, small industrial plants and logging camps. This line is a network of switches, towers and trackage possibilities. Another line, now extinct, leaves a wealth of detail for the lovers of old time roads. Relics of railway bridges (early construction), roadbeds and right-of-ways may be found in the most unexpected places. Another of our plans for the vacationing model rails is to afford a stock of prints copied from old photographs made of these surrounding in the days when local railroading was young, when the teams of oxen were used to haul the heavy Redwood logs down the old dirt trails.

If time and space allow, we shall include a small workshop in one corner—a place for model buildings away from home, upon payment of a small hourly fee, may avail themselves of drill press, lathe, grinding wheel, table and band saws and other power tools. One only needs to leave home for awhile, take up abode in a new place and start upon a simple project, to fully appreciate the need for special tools. "If I only had my such-and-such here!", is a common lament. Such lack of tools we plan to supplement, and more. Thanks to one modelers meditations, a new project is under way. Time and summer will tell.

We note that Model Craftsman's Editors will furnish names and addresses of nearby dealers and fellow modelers to vacationers. It seems only right that we send them names of modelers in our neighborhood, from time to time, when we learn of them. As for the future of model railroading, it is our personal opinion that Model Craftsman—now devoted exclusively to that hobby—has set its beam onto the pastime which will become America's No. 1 Hobby!

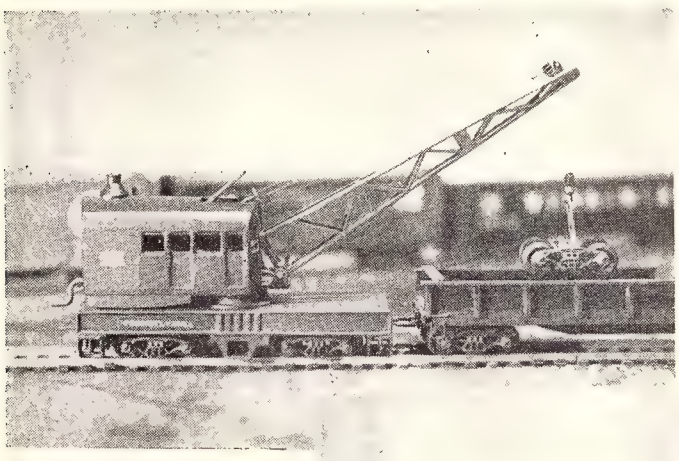
Freelance Derrick Car

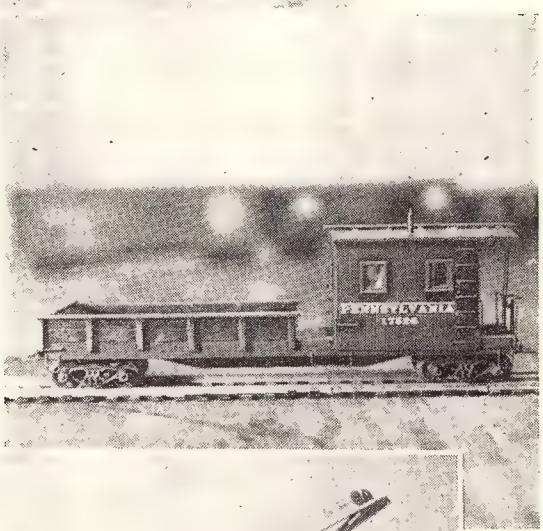
By SIDNEY ABRAMSON

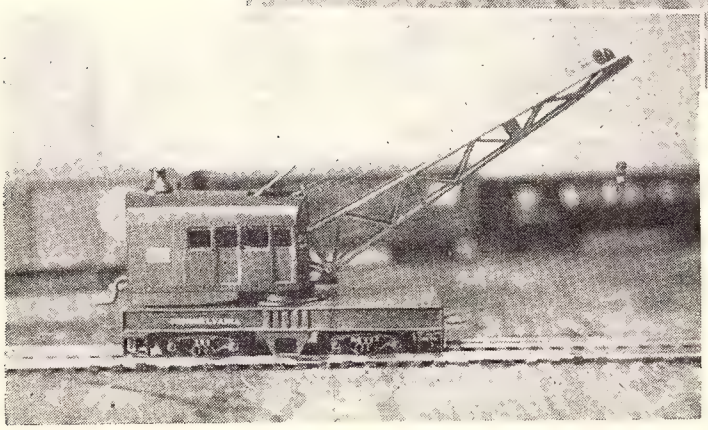
Here are several excellent shots of an O gauge derrick and boom car. These freelance cars were made from complete construction plans by Lew Austin in the December '43 and January '44 issue of the Craftsman.

These cars represent the builders first attempt at model railroading projects although he has been making various models for a number of years and is employed as a tool maker. It took approximately six weeks, working evenings only, to complete these detailed models and even though it was a lot of work, it has added another staunch fan to the ever increasing number of model rails.

The construction details are similar to Mr. Austin's. The car was made completely of brass, the only parts purchased were the trucks, two pair of gears and the couplers. The pulleys and a few of the other intricate parts were made by Mr. Abramson at a local machine shop. The rest of the car was made at home on the kitchen table. A special type of vise was designed which worked very well in filing all the parts, especially the boom which was made of two pieces cut out and filed, then bent and soldered together. The rivet detail was put on by using an automatic centerpunch which gave the same tension for every rivet.







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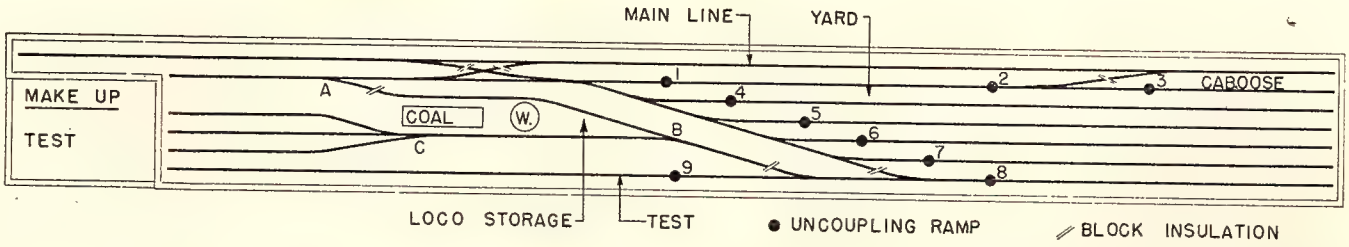

Layout Limited

By D. J. PRUDHOMME

FOR the past several months I have been faithfully following the articles on "Doctoring" layouts. Someday I hope to make use of many of the suggestions, however, at the present time I am not in a position to have a large layout and as there are no doubt many other model rails that are "layout limited," in one way or another, I have a suggestion to make. Why not doctor a *section* of a layout so that some actual railroading can be done under existing conditions and yet have something that can be used all, or in part, later in a larger layout? As an example, I'll cite my own case.

Being restricted to a minimum of physical work and financial expenditure, due to a coronary condition and a year's sick leave from my job, I have had to be satisfied with an operating HO layout on one side of a sunroom. This has grown from one track on a six-foot board to a conglomeration of turnouts, crossovers and track on a 1' x 14' shelf at window-sill level.

This layout just "growed" so is full of mistakes, experiments, improvements and shortcuts, but has provided for the operation of 3 locomotives and some 35 odd cars. Using this layout, I have developed an automatic coupler, electrically operated uncoupling ramps and a good switch machine. Now I'm to the point where I can assemble a slightly larger layout, using my switch machines, ramps and homemade switches and a newly designed control panel that will allow operation from an 'armchair," of a yard and section of a main line.

My idea is that this yard layout can be used now providing plenty of switching and make-up operation, as well as experience in building several unusual switches, and can at a later date be incorporated into a larger layout in the basement.

The layout is located in a room 8' x 16'. but as there is no other place to move the furniture, the right-of-way is limited to the outside wall, 14' long by 15" wide, with a 2' extension of the mainline track back of a cabinet. Suitable support is obtained by brackets resting on the window-sills and on legs at the edge of the layout. This allows for the necessary floor dusting and keeps peace in the family. I find that this height (2 feet) is very satisfactory, when the engineer and the visiting firemen prefer sitting to standing.

Referring to the plan, I have in mind the following operation. Assume a train arrives from the west on the mainline, takes the diamond crossover to the makeup track, engine uncouples at 2—takes crossover to main and returns to diamond crossover and end of makeup track. Then through the engine facilities, coal and water, "a" to "b," then to engine storage, "b" to "c." In the meantime, the switcher can breakup and makeup a new train. When ready, another engine, which can be stored facing west, can be run out to track 6, down the yard lead to the makeup track, back into the waiting train at ramp 1, and head west through the diamond crossover.Having two road locomotives and heading one east and the other west, takes care of the lack of a turntable. I have hopes of moving that corner cabinet, and putting in a roundhouse and turntable along side the mainline stub; but that's a future project, in fact two of them; one to get the right-of-way and the other to build the turntable.

You will note, that I plan on four blocks; and with 2 cab controls, I can run on the main line or test, and makeup in the yard or several other combinations of dual operations. Building this layout will provide considerable experience as I am also making my own switches. The #6 turnouts are completed as well as the crossover and I've started on the diamond crossover. The 3-way switch at engine storage seemed logical and it looks intriguing to make and control electrically. My control panel will be of unit construction, with provision for 8 block switches with indicating lights, reversing key and rheostat, at each cab control; a unit of push-buttons for switch operation and a unit for power control and meters, as well as selector switch and pushbutton for ramp operation. In other words, the control board will *also* be suitable for future use on a large layout, with a minimum of changes or alterations.

This is but an example of what can be done in limited space. Armchair railroaders who live in crowded quarters can at least build sections of those future railroad empires. There's no need to sit back and wait!

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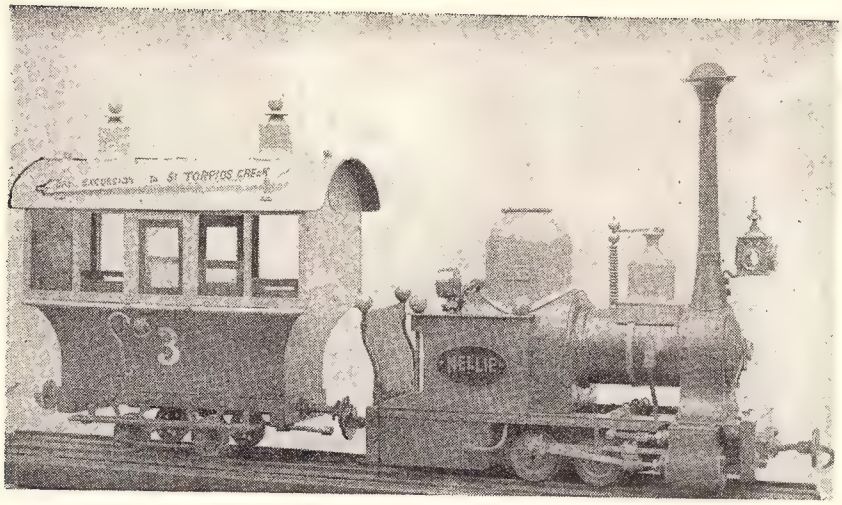
CARTOON BROUGHT TO LIFE

WE HAVE just received a very interesting letter together with the photo (opposite page) from a model builder in Australia, Mr. N. H. Messer, an ardent live steam enthusiast. Mr. Messer constructed this model from a cartoon appearing in "Punch," an English publication. The cartoon showed this strange looking engine pulling several crowded, antiquated cars loaded to capacity with passengers. The following caption appeared below the cartoon, "Takes a bit



gine was not exactly what could be described as a small model.

The Weeden product more or less marked the end of the miniature steam fire engine as far as commercial models made in quantity went. There had also been, however, earlier models manufactured abroad which, while differing greatly in style from the Union and Weeden designs, offered the same fascination of raising steam and actually pumping water.

One of the best of these models is also illustrated. It was sold in England by W. J. Bassett-Lowke & Co., although actually manufactured by Bing Brothers in Nuremburg. Bing, as well as other continental European manufacturers had previously made up a number of types of less elaborate steam fire engine models. The engine pictured dates around 1903-1910.

of getting used to, a spot of 'oliday traffic." (We still don't get it!)

Mr. Messer constructed this accurate model from scrap material in 2½" gauge. The cylinders are ⅝" bore with ¾" stroke, valves on top. The boiler barrel is 2 inches in diameter and 2 inches long. The outside size of the firebox is 3¼ x 3 inches, inside measurements are 2¼ x 2½ inches, and the tubes are 4⅜ inches. The grate area is 4½ square inches, drivers are 1¼ inches in diameter. The only alterations from the cartoon is a square sided firebox instead of the circular and also the drivers are slightly further apart. Aside from these small changes, all the details are faithfully followed, even to the cracks in the windows and the grain of the wood. Notice the English type of couplers. When the locomotive puts on its brakes, the individual car couplers engage in such a way setting the brakes in every car of the train.

This engine is coal fired and joins nine other live steam locomotives constructed by Mr. Messer during the past thirty years. His latest brainstorm creates tremendous commotion when running on his back yard pike. This photo was submitted for "Your Nabor's Pike" page and, in writing, Mr. Messer asks, "Please sir, what is a 'buck'? In Australia we use this word to denote a male rabbit; certainly you don't ship live bunnies through the mails?" (That would be the ideal way to pay off—by the time the shipment arrived, the creditor would be paid off a thousand fold!)

To fully appreciate the workmanship of this model, you should see the cartoon which served as the blueprint, however, we were unable to procure a cartoon for reproduction.

ALONG THE TINPLATE TRACK

(*Continued from page* 19)

This model is also illustrated, and quite obviously was designed after a somewhat more modern prototype than the Union engines. It more or less closely followed the lines and arrangement of the real engines, and picked up water through a suction hose. The boiler was fitted with a water gauge, whistle and safety valve. The price was $6.75 in 1911, and the en-

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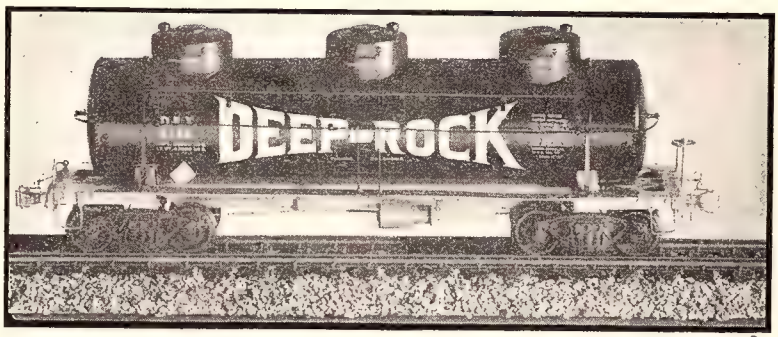

ROLLIN J. LOBAUGH

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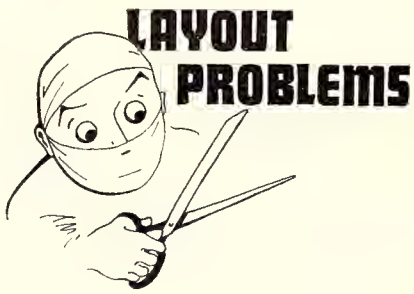
This model, although unusual in style to American eyes, closely followed typical European fire engine design of the day, even to the longitudinal seats for additional firemen to ride on. The model was extremely well made, with cast iron wheels with nickel plated rims, and quality boiler and pump fittings. It was equipped with a suction hose, and two separate hose lines through which to pump water, each controlled by an individual cock. "Delivery pipes and branches" were also sent out with each model.

The Model Engineer and Electrician, famed old British model magazine, was sent a sample to examine, and described it in their issue of January 7, 1904: "The fire engine is a very realistic model, well made and works splendidly. It has two jets and a by-pass; the suction hose is fitted with a strainer, and the delivery side of the pump has an efficient air chamber. The small jet will throw a very fine stream for a distance of some 3 ft., and the other one a larger stream double this distance. This jet delivers—to use a model measure of capacity—a teacupfull of water per minute continuously, and whilst the engine is working, the steady thump, thump, thump, common to the prototype is present in the model—of course, in a proportionate degree but still very noticeable."

As companions to this pumper, Bing also made model "Metropolitan Fire Escapes" (extension ladders mounted on two wheel carriages), and "Salvage Corps Wagons." These latter were equipped with "shafts, ladders, tool boxes, lanterns, bells, etc." The most elaborate model came with "one Mechanical Fire Escape, three ladders, one hand pump, two hooks, etc." and must have been quite a fitting mate for the steam fire engine.

In the later era of the 1920's and early 1930's, a number of elaborate, and sometimes fairly accurate, miniature fire engines were produced as expensive steel toys. Their "working" consisted merely in their ability to throw a stream of water, and as they accomplished this neither by means of the steam or gasoline mechanisms of their prototypes (around 1910-1915 Bing even produced a fire engine model with a clockwork driven pump), but through a small hand pump and compressed air, it is hardly fair to classify them in the same group as the older working steam models pictured. In the days when Union and Weeden and Bing, and others were making such miniatures, fire engine models were *really* models!



By THE LAYOUT DOCTOR

Each month in this space the Layout Doctor will answer questions put to him in his fan mail. The questions will be reworded in the interests of brevity and clarity and attributed to a mythical person from a mythical locality since often essentially the same questions are asked by several persons. Questions not requiring extensive work will also be answered by mail if a stamped and addressed envelope is enclosed.

Dear Quack:

That small layout on page 24 of the May Model Craftsman suits me fine, except that I am working in American Flyer $\frac{3}{16}$" scale, otherwise known as S gauge. I use tin-plate switches and scale track. I can make curves as small as 20" radius. How can I convert the plan to S gauge? How can I reduce the grade at the right end?

(signed) R. Fishygan,
Sichigan, Mich.

Dear Fishy:

Since you want 20" radius curves while those on the plan are listed as 18" radius, you can enlarge to that size, regardless of gauge by increasing all dimensions in the ratio of 20:18 or 10:9. Thus the six foot or 72" length when divided by nine and multiplied by ten becomes 80" and so on. You will have trouble with your clearances though, and I don't recommend this method except when enlarging in the same scale and gauge.

Since S gauge is about 1.5 times HO, you can simply multiply all dimensions by 1.5. Thus the panel instead of 4 x 6 ft. becomes 6 x 9 ft. and the clearance at the bridge becomes 4.5". The radius of the curves becomes 27". For O-Gauge, multiply HO dimensions by 2; for OO Gauge, by 1.25; and for TT, by .75.

To reduce that steep grade, make the bridge at only 2" elevation. Start the lower track downhill just past the engine house switch to a height of 1" under the bridge then up again to 0" grade at switch A. This was not included in the plan because I understood that Mr. Christ's layout was on a panel. Hence as much trackage as possible was kept level.

Dear Doc:

My husband has recently become a rabid trolley addict. He has built ten feet of O gauge track and hung three feet of wire. On this he pushed back and forth an old toy passenger car with a straw stuck in the roof for a pole. The walls of our living room are practically papered with destination sign rolls from the Lehigh Valley Transit, Hershey Transit, etc. and

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he has a Third Avenue Railway fare register in our bathroom with a cord running down the hall. You should see him manipulate the kitchen faucets and mixing spout like he was the motorman on the owl run: he rings up fares with the light cord, uses the garbage pail lid lifter lever for the dead man's control and opens the drain instead of throwing in the field taps. He is now talking of acquiring a Connecticut Co. open car as a summer house for our back yard.

Now, doctor, there is going to be a layout around our house, and I am going to do the laying out, with the help of our poker which he has reshaped into a switch iron. Then I am going to finish up with a controller handle he got from the Delaware Electric Power Co. Doctor, do you think this is funny?

(signed) Edna Herr Rope,
Pepper Lake City, Utah.

Dear Edna:

No! Do you?

Hey Doc, I don't remember forwarding this letter to you . . . Ed.

LAYOUT DOCTOR

(*Continued from page* 7)

Second, I like the trestle on your mountain division, only it rather falls flat since it doesn't cross anything. So I would move one end of it out from the wall and run the other track under it instead of just in front. Then in the front run a double track and you have a layout permitting a long run—an inside out figure eight.

Your four switches I would utilize to form, first of all, a passing or run around track at the front of the table work, plus two yard tracks running off about as shown. When you get two more switches, I would install a crossover between the parallel tracks at front right. Other trackage that can be added later is shown by dotted lines. A third yard track and perhaps a fourth could also be added.

Operation of course will be relatively simple, just making up a train from the small yard and heading off down the line in either direction. It should be possible to run two trains at once if kept going the same way.

You will note that I have reinstated the single diagonal cut off track, although as a general rule, I disapprove of just one. This diagonal track has two purposes: (1) to permit a reversing loop to turn the engine, thus eliminating the need for a turntable and: (2) to serve between times as a double ended interchange track. In this latter respect, a car can be set off at one end and later picked up by the interchange railroad at the other end.

Some tunnels can be added to the scenery at the right end, particularly in the back corner but they would be optional.

Although the layout is shown for O gauge, by halving all dimensions, including the elevation figures, it could also be used in HO or OO gauge. In HO, though, the minimum radius curve would be nine inches instead of eighteen, so that specialized motive power such as a dockside switcher would have to be used. Or the whole pike, sized now two and a half by eight feet would make a very nice interurban line with perhaps extra passing sidings at each extreme end. For use as a regular HO railroad, the panel should be wider, at least five feet and better, six. Of course, this would permit the use of wider radius curves and allow room for a little more extensive yard layout.

In the August issue, the Layout Doctor fixes up the layouts of D. J. Webb of Ottawa, Ontario and Jim Thomas of Woodbridge, N. J. In sending them in, the Doc remarked that they were two of the best layouts of his career, that he would like to have both of them himself! The Webb pike will be a two level affair featuring helper service. The Thomas pike is a well--scenicked simple track plan, and includes an auxiliary trolley line that features three-way meets at a wye.

ONCE UPON A RAIL

(*Continued from page* 35)

(headlight smoke box front and cylinders.) The after end is shown in the simplest form, with the addition of boiler head, seat boxes and other refinements at the pleasure or disregard of the individual builder.

The fuel and water tank is made from a piece of valley tin, folded and soldered as indicated. Notice that this piece (Figure 6) includes the rear bolster and the link pin coupler. Both front and rear bolsters are curved at the ends and should be backed with wood.

The dash (including bolster) shown in figure 4, is made of soft, bright "tin" and is beaded around the edge with #18 wire. The fender (Figure 8) is made of #14 soft drawn brass wire, with three supporting rods butt-soldered as shown. Bend about $\frac{3}{16}$" below the middle support and plait the finished fender frame with $\frac{1}{16}$" wide black, patent leather plaiting. When bent to shape, set the plaiting with an all over coating of shellac.

If a locomotive pilot is preferred, it should be of wood to be true to type.

The sides of the Governor Corbett offer welcome relief from the usual tedium of cutting out windows, as only the last window in each side needs to be cut through. Make a template from the car side shown in Figure 1, including the wheel skirts. Cut out from bright tin, add wire beading and bend to conform with the ends. The dummy windows can be simulated by cementing a piece of bright green paper over the entire area representing the dummy windows. Cement a layer of clear cellophane over this, and add window framing using either a cardboard cut out, or separate stiles of $\frac{1}{8}$" wide balsa stripping. The Engineer's open window should be fitted with an arm rest to keep your hoghead happy. With the windows "sealed up and painted over" little or no attention need be given to boiler fittings.

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MODEL CRAFTSMAN

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diameter by ⅞" long is mounted in the same manner at the other end of the car.

The roof is the easiest one we've encountered so far. Whittle from Idaho Pine to the dimensions shown in Figure 7 and glue on the monitor after painting. Belled Baldwin type stack, steam port, whistle and bell are made up from scrap or turnings. Brackets or pegs corresponding to the inside corners of the car, are set into the underside of the roof, to hold it in place.

Name and number panels may be cut from heavy white celluloid and put on after the paint job has been completed.

The body of the Governor Corbett is finished in high luster jet-black, with maple window frames and bright green roof. Hand rails, cylinder trim, headlight and bell are of brass. If you plan night operation, place the largest orange bulb your circuit will carry in the fire box for a convincing glow of light in that direction.

Obviously the Dummy isn't good for revenue as she stands, but she'll handle a thirty-six foot coach, a small flat or a four wheeled open summer car with ease.

The coach shown in Figure 10 differs from conventional day coaches in that the platforms are exceptionally long for rapid loading. The coach is ¼" narrower in over all width than the Dummy. The roof is of very old design and the weird looking "dingus" in the middle is a ventilator common to closed cars in that day.

The Trailing car can be a quickie constructed from scrap or by reconverting an old style day coach kit to the shorter dimension. If the car is to handle city traffic, safety gates should be added to the platforms. Solid street car dash boards are substituted for the conventional iron railings and the steps are made overly long to accommodate platform riders during rush hours. A pinsch gas cylinder for the gas lighting is slung between the truss rods and the little details such as conductor's bell rope, marker lamps, faded green window shades and raised medalions for car initials and numbers add greatly toward making your trailer a fitting compliment to the cinder-belching Governor Corbett.

MODEL RAILROADING CAREER

(*Continued from page* 10)

baggage, one combine, one pullman, and one observation. September came very quickly that year and it was time to close the railroad, and return to the city for the winter.

It's really true what they say about the railroad bug, because I have been bitten badly. I could not get trains out of my mind all that winter. Again I took to HO hoping that I might like it. After building another two cars I realized that it was not for me. Later in the winter I read about TT gauge — something new! Having tried most of the other gauges, I figured that I did not have much to loose by trying it. I bought two streamlined cars, a diesel, some track and a power pack. I liked TT very much, probably because it is so novel and not much detail is necessary to make them look realistic. The space problem came again. We have a baby grand piano

with a beautiful flat top. I bought a piece of felt and put it on the piano, then I placed a piece of plywood cut to shape, over the felt. I laid track and had an operating layout in TT. It was very novel to see the small trains move about on the New York Division of the Putnam Valley R. R.

Spring came and along with it thoughts of my S gauge layout in Peekskill. A lot had to be done that coming summer and a scheme for scenery had to be planned. I decided to divide the layout in three parts, a town, farmlands and an industrial center.

Our house is located on a state road and I found that the chopped stone on it would make very good ballast for the American Flyer rail. Then I began work on the mountains. I had planned on having three of them. The methods for building them were much the same as you read about in the various construction books. Plaster mixed with asbestos applied over ¼" screening. For this work I used 250 pounds of plaster and 50 pounds of asbestos. When the plastering was finished, I painted the surfaces and sprinkled them with sawdust grass. Then I touched up the entire thing with various color paints. The paints were splattered on for realistic effect. One of the mountains has a coal mine in it with an HO car that goes in and out of the mine. It all works automatically. (see diagram.)

There is one large town called Plywood located on the main line. I used HO buildings and each is equipped with electric lights controlled by separate toggle switches. The town has sidewalks which are made from shirt cardboards and equipped with fire hydrants and mail boxes. For hedges in front of the various buildings, I used a kneeling pad which was cut in strips and painted green. A few miles south of Plywood is the Industrial center of Ranger, noted for its large factories. Still further along the line is Centerville, largest town in population, having all of 68 HO persons. The farms along the right-of-way are modeled after those along the New York Central's Putnam division.

There is one body of water on the layout (and I mean real water). I made this by taking a piece of sheet metal, bending it to shape and placing it in position on the layout. The banks were made out of white cement and rocks were put along the edge. All the metal showing was then covered with asbestos roof cement. This was left to dry and the whole surface was painted a bluish brown. The banks were colored with burnt amber to simulate dirt. Then I filled the lake with water (4 quarts) and put a bridge over it. The trains are run by timetable in one direction only. I took a clock and speeded it up 5 times. Then I cut off the hour hand and used the minute hand for hours and the second hand for minutes. In this way 1 scale hour equals 1 real minute. This is Putnam Valley Standard time of course. I was compelled to speed up the time so much because of the short distance between stations.

My control panel is centrally located and the whole layout can be operated by one person. This coming summer I plan to extend the benchwork 20 feet for yards which will accommodate my fast growing roster of equipment.

GETTING STARTED

(*Continued from page* 13)

somewhere. Then, no matter how faultless the operation afterwards, it is just not possible to regain the lost prestige. It is much better to have simpler operation and have everything run like clockwork. And don't fool yourself by thinking that you may be a pretty good electrician in other lines and such a thing will never happen to you. In model railroading you are dealing with low voltages and amperages—things can happen that will really astonish you. More than one railroader who has had a studio electrician or house or automotive electrical expert help him wire his layout has had them give up in disgust after having some scheme or plan backfire.

I am a long ways from being an expert and I don't know an ohm from a———, in fact I wouldn't recognize one if I met it face to face but I am going to try and tell you how to wire a simple pike. Also how to wire a switch or a reversing loop. So until you can get better advice try and bear with me for a spell.

In the first place electricity *cannot* go where it is not lead and the wiring is our method of leading it to the right spots on the road. Now don't get technical with me, I am speaking of model railroading. We also use the track itself for conducting a large part, in fact, most of the current around the pike. Now for our purpose we are dealing in *direct current*, in other words a current that travels in one direction only until reversed through a switch or other means intended to reverse the positive and negative leads. It is standard in model railroading to use positive current in the right hand rail and negative current in the left hand rail for the forward running of a locomotive. So if you hook up your power pack or battery to a *straight* stretch of track with the positive on one rail and negative on the other that track is powered when the juice is turned on. To regulate the speed of our locomotive we cut down on the current supply by means of a rheostat to slow it down. The same type of simple connection is used on a *circle* of track as the positive rail always remains the same and so does the negative. The only complication here is, if the circle is so large that the resistance in the rail cuts down the current so that when the engine reaches the furthest point from where the track leads are fastened, it slows down. Then we need an additional set of feeder wires or more to boost the current. To help overcome this resistance in the rails, we solder short pieces of jumper wire from one rail end to the adjoining one. This wire should be flexible type. These jumpers carry the current through a soldered connection and do a much better job than the rail joiners.

So far so good. Now we come to a switch. The most important thing to remember here is *never* to let the current sneak up on the back side of a switch. The back side is that away from the switch points or closure rails. Always feed the current through a switch from the point

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6000 N.Y.C. Loco & Tender	Nov. '45
Central Vt. Loco.	Jan. '46
C & O Hopper Car	Jan. '46
Southern Pacific 4-4-0	Mar. thru June '46
Build a Steam Shovel	Nov. '46
N & W Hopper Car	Nov. '46
Roundhouse	Mar. '47

O GAUGE

Motorized Wrecking Crane	Sept. '44
Mother Hubbard 4-4-2	July '46
Suburban Double Ender	Sept. '46
Worm Drives	Nov. '46
Ten-Wheeler Loco	Feb. '47

OO GAUGE

Six Passenger Cars	Nov. '44
War-Time Car Building, Express Reefer	Apr. '45
Double-Deck Sleepers	Apr. '45

PROTOTYPE DIMENSION PLANS

Railroad Station (Plans in HO)	July '44
Coal Breaker	Nov. '44
"Old Time" Railroad Station	Dec. '44
Reading Camelbacks	June '45
Burlington's "Vista-Dome" Observation Car	Nov. '45
U.P. 800 Class Loco.	Dec. '45
Erie Caboose	Jan. '46
C. & N.W. Pacific 4-6-2	Feb. '46
B. & O. Mallets	June '46
Penn E-6 Atlantic	Aug. '46
Loco Traveling Crane (all gauge)	Oct. '46

RAILROAD MISCELLANEOUS

Laying Out HO Pikes	April, May, July, '45
A Model Saw Mill	July, Aug. '45
Bridge Warnings	Nov. '45
HO Trestle	Dec. '45
Simple Crossing Gate	Dec. '45
Standard Brick Signal Tower	Jan. '46
How to Build Tunnels	Feb. '46
Bridges	Mar. '46
HO Coal Tipple	Apr. '46
A Terminal Throat	May '46
A Big Interurban Layout	June '46
V & T Passenger Station	July '46
Track & Scenery Foundation	Aug. '46
Three-Way Switch	Aug. '46
A Simple Interlocking Plant	Sept., Oct. '46
B. & O. Coal Tower	Sept. '46
Speaking of Water Falls	Oct. '46
Does Your Layout Have a Church?	Oct. '46
Two Rail Signals	Dec. '46
Where to Put your Feeders	Dec. '46
Master Control Board	Apr. '47
Interlocking Without Relays	May '47

TROLLEYS

Model Cattle Car (Prototype Dimensions)	July '44
Shooting Trouble on HO Motor Trucks	Oct. '44
Trolley Wirework	Nov. '44
Interurban Depot & Substation	Feb. '45
Hudson & Manhattan Tube Cars	Mar. '45
Interurban Mail	Apr. '45
"Open Air" Elevated Railways	June '45
Yards, Barns & Terminals	July '45
Trolley Work Cars	Aug. '45
Trolley Snow Plows	Nov. '45
Trolley Front Ends	Dec. '45
Trolley Freight Service	Jan., Feb. '46
Power for Your Trolley	Mar. '46
Double Cab Work Car	Apr. '46
Pacific Electric Car (O Gauge)	May '46
Modeling Traction Interurbans	Nov. '46
Small Interurban Cars	Dec. '46
Interurban Diner	Mar. '47
Narrow Gauge Coaches	Apr. '47

LIVE STEAM

Valve Gears, Gear Frames & Boiler Saddles (¾" sc.)	July 44
Boiler Injector & Lubricator (½" sc.)	Aug. '44
Engine Pilot, Pilot Beam, Water Gauge (½" sc.)	Sept. '44
Single Cylinder, Steam driven Feed-Water Pump (½" sc.)	Oct. '44
Home-Made Cylinder Cocks (½" sc.)	Oct. '44
Atlantic Live Steamer, ¾" scale	Nov., Dec. '44, Jan., Feb., Mar., May, June, July '45
½ H. P. Horizontal Steam Engine	Feb., Mar., May '45
Boiler Feed-Water Pump (½" sc.)	Feb. 45
Advantages of Inch Scale	Mar. '45
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Assembly & Connections (½" sc.)	June '45
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Stationary Steam Engine	July thru Oct. '46

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Realistic Tinplate Cars	Dec. '45, Jan. '46
Tin-Types "Trued to Life"	June '45
Along the Tinplate Track	Monthly Feature

AIRPLANES

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Dizzy "B", U Control (Greene)	Nov. '45
"Butch", Class C Guide Liner (DeBolt)	Dec. '45
"Moldy Molecule", Class B & C Guide Liner (DeBolt & Thomasian)	Jan. '46
"Thunderwin", U Control (McElwee)	May '46
The "Atomic", U Control (Shulman)	June '46
"Pirate", Control Liner (McGovern)	Sept. '46
Your Engines (Class A & B Survey)	Aug. '46
Your Engines (Class C Survey)	Sept. '46
Engine Maintenance & Operation	Sept. '46

ELECTRICAL ARTICLES

Home-Made Telephone	July, Aug. '44
Battery Charging Hints	Aug. '44
Switch Motors from Doorbells	Oct. '44
Polarity Indicator	Oct. '44
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O Gauge Motors	Oct. thru Dec. '45
Universal Wiring Circuit	Apr. '46
Train Control Rheostat	June '46
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Electricity, "What is it?"	Jan. '47

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Getting Ready for Racing	Mar. '45
Building a Model Race Car	May thru Nov. '45
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Test Car #2	July '46
Rail Track Construction	May '46
Cable Track Construction	June '46
Wire Spoked Wheels	Nov. '46
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end. Now I'll make a little concession. I meant to say the switch *frog*, the frog being the crossing of the diverging rails in the switch (but I ran out of space and couldn't get it in and Mr. Editor I have already done this page three times!). The reason for this rule is that when the switch is set for straight through, everything is OK as the positive current, assuming that our direction of travel is into the point end of the switch, is in the right hand rail and goes right on ahead. The negative current in the left rail gets to the frog all right but, owing to the fact that the right hand closure rail is away from the right hand rail, no short results. The minute you throw the switch you have created a dead short between the right and left hand rails. To prevent this short from traveling around the layout and do some harm we cut the rails or make a gap in back of the frog. Current to these severed rails is then supplied from in back of the switch but the switch itself is powered only from the front. The points of the switch will conduct the current fairly well but for more positive conduction it is wise to solder small thin strips of phosphor bronze or spring brass to the rail on each side of the points to provide a sliding contact. Be sure these strips or contact points are not so long as to provide contact with both sides at once or you will have a short. The gaps in back of the switch frog also provide a safety factor in preventing a locomotive from running the switch from the back side as when the switch is thrown against it, the rail extending from the frog to the gap then becomes the same polarity as the opposite rail. Thus the loco would slide to a stop. No short would result either unless one of the metal wheels of the loco or tender happened to come to rest exactly bridging, or making contact, over the gap. You see the polarity of the rail in back of the gap would not have changed. This does not happen too often, however, and if it does the momentary short resulting would only throw the circuit breaker, and that is much better than having the loco run the switch, possibly into another train. After you have inadvertently caused the loco to coast into a short such as above you would, of course, immediately cut the power to that track by throwing the toggle switch supplying its current.

A more complicated set-up is that of a reversing loop, that is, a loop that doubles back on itself to the straight track from which it originates, thus completely reversing the direction of travel of the train after it arrives back on the straight track. This movement is possible, without any stopping or jerking of the train whatsoever, by simply flipping one toggle switch at the right instant and throwing the switch on the track over for the return of the train. This wiring set-up is difficult to explain but if you will remember one fact and study the diagram closely you will understand it. That fact is this, briefly: A model loco runs in a forward direction if the positive current is in the right hand rail. Let us say it is going west. Now, without doing anything else, pick up the loca and set it on the track headed east. Now the loco will still run west, although headed east, so it is really going in the original direction but running backwards. You see, when you turned it around, without changing or reversing the current, that changed the polarity of the rails, as far as the locomotive was concerned, as the right hand wheels of the loco were changed from the positive rail to the negative. *Simple, isn't it?* So if your train is headed west and into a reverse loop that will bring it back on the line headed east, you will have to change the polarity on the *straight* and also on part of the reverse loop in order to always keep the positive polarity in the right hand running rail at all times. This, and many other wiring set-ups are very well diagramed and explained in a little booklet called Two-Rail. It is the best value for the few cents it costs that you will ever get in model railroading. I lost my copy several years ago, but I wouldn't be without it if I was a beginner if it cost several dollars. It used to be two-bits.

One other thing I want to mention is the method of reversing your trains for switching operations, etc. on the layout as a whole. You can buy a rheostat that has two resistance coils and a built-in reversing switch. Thus, if you twist the knob to the right, trains go forward, and to the left, they go backward. This makes for a little simpler wiring in your control panel and they work very well but I personally prefer to use a single coil rheostat and wire in a double pole, double throw, reversing toggle switch right above each rheostat. Then if you are doing switching, bring the loco to a stop, leaving a little power on, flip the toggle the other way, and open up the rheostat enough for a smooth start in the opposite direction. You soon become accustomed to the right amount to turn the knob for smooth starts. Then too, with the toggle mounted so as to throw crossways of the control panel, that is, in a parallel plane with the trackwork, you wire it so that the toggle always points in the direction of travel. The double coil type of rheostat always has play or lost motion that is very hard to get the feel of and slow, smooth, starts are difficult to perform.

Another thing, in mounting any reversing toggle switch on the board, always have them so that the direction in which the toggle is thrown will always indicate the direction of travel. Also have all rheostats and other switches or controls for a specific section of track mounted together in banks. Then it is easy to make a little diagram and mount it above each section, if you wish, showing sidings, spurs, etc. If the thing is very involved you can mount reversing loop toggles, toggles for electric switch machines, and the speed controls or rheostats right on the section of track controlled by them. Also little indicator lights may be incorporated to show how switches are set, whether or not track is clear or showing route set-ups. While it was not intended to go into great detail on electrical hookups I realize that this article has only touched upon the high spots. However, it may help some of you to get a start and later on we will go into the thing a little deeper after getting some more of the trackwork installed. Also we will have one on yards and sidings.

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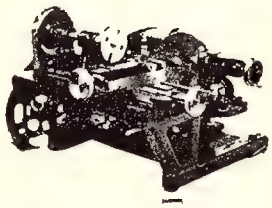

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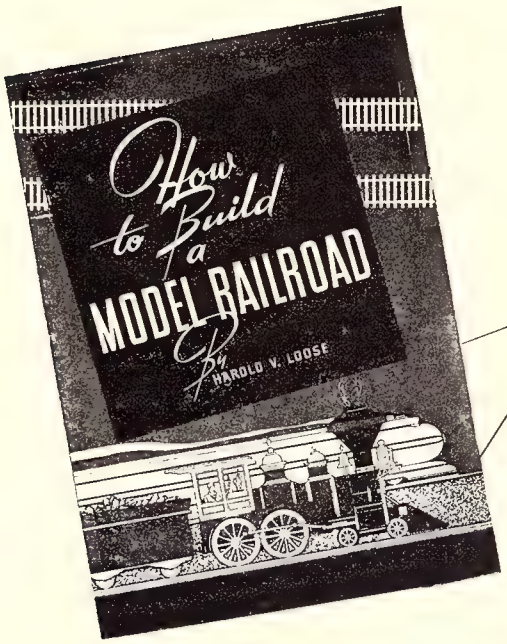

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GENERAL ELECTRIC 0-4-4-0

(*Continued from page 8*)

The switch base is made out of 1/16" thick linen bakelite. The handle of the switch is also made of the same material. Cut out the base of the switch as shown on the drawing and rivet the angle piece to it. This angle piece is made out of 1/32" sheet brass. Tap two more 2-56 holes in the loco roof so that the switch can be mounted in place with 2-56 screws through the brass angle piece. The contacts on the switch base are simply 2-56 screws mounted through the base and screwed into the 1/32" thick brass lugs on which the wires will be soldered. After the screws are in place, file the heads flat so that the switch lever can slide on top of them. File the switch lever to shape and mount a brass rivet through a hole in the bottom end. Then solder a brass lug to the end of the rivet. Mount the lever on the switch base with a 2-56 screw and nut. The lever pivots on this screw.

Mount the switch assembly in place under the roof with 2-56 screws and then mount the battery holder. The wiring is shown on the drawing. When the switch is pushed to one end of the slot, the light should light at that end. When it is pushed to one end of the slot, the light should light at that end. When it is pushed to the opposite end of the slot the other light should go on. When the lever is in the center of the slot both lights should be off.

The pantagraph may seem complicated, but it is really very simple to model. Make the base first. As the drawing shows the base is built up out of four brass angle pieces. These pieces are all made out of 1/32" sheet brass. Solder the parts of the base together and drill and tap the 2-56 holes shown on the drawing. The supports for the base are cut out of 1/16" thick linen bakelite and fastened to the base with 2-56 screws. When this is completed, cut four pieces of 1/4" diameter brass tubing about 1/4" long. Then mount the base in place on the loco roof with a piece of tubing in each corner. Four 2-56 screws through the tubes hold the base in place on the roof. This can be seen clearly on the side and end views of the assembled engine that were on the drawings that appeared with part three of this series. The pieces of tubing are soldered to the loco roof and the pantagraph base removed.

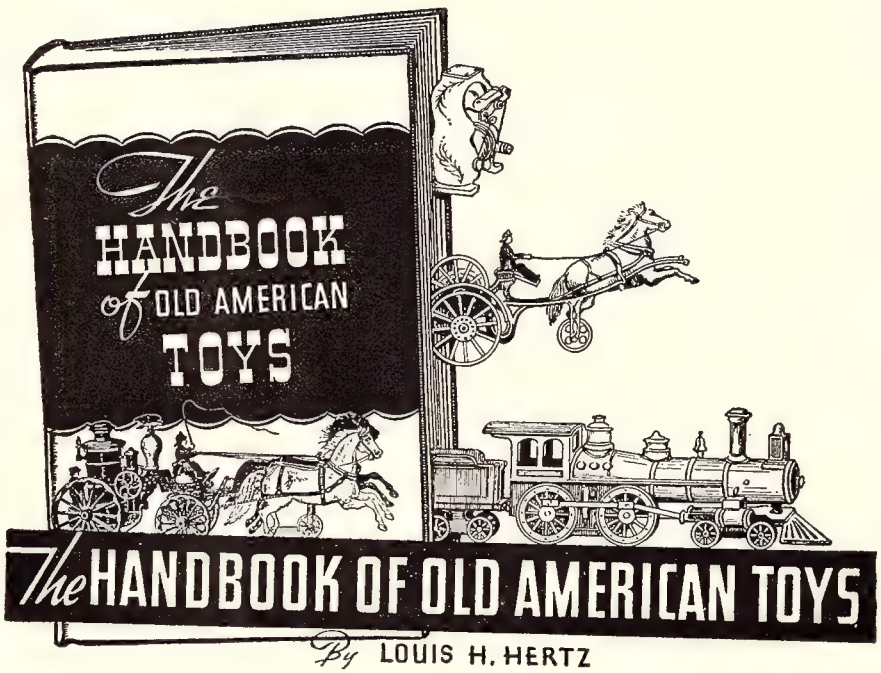
As the drawing shows, the pantagraph has two gear sectors soldered in place on the shafts and bottom arms. These gear sectors keep the pantagraph lined up in any position and prevent the pantagraph from leaning back from the drag of the overhead wire. Any fine clock gears are suitable as long as you can get two that are alike. However, the location of the 1/16" diameter shafts at the bottom of the pantagraph will depend on the diameter of the gears that you use. Also the lower arms will have to be shortened or lengthened to suit the gears. The drawing shows the location of the shafts on the pantagraph of my model.

The arms of the pantagraph are cut out of 1/32" sheet brass. Drill #60 holes in the ends of the arms with the exception of the bottom ends of the lower arms. These are drilled with a 1/16" drill to fit the 1/16" diameter shafts. Solder the gear sectors and arms in place on the shafts and mount them in place in the base. The small hooks shown on the perspective view of the pantagraph are bent out of wire and soldered into holes drilled through the shafts. Small coil springs are fastened to these hooks to hold the pantagraph in its up position.

The rest of the construction of the pantagraph is clearly shown on the perspective drawing. Use #60 wire for the joints of the pantagraph and use thinner wire for the cross braces. The shoes on the top of the pantagraph are bent to shape out of 1/16" brass rod and soldered in place. Make the catch out of 1/32" sheet brass and rivet it in place on the base. A small coil spring is fastened from the catch to one of the angle pieces of the base to hold the catch in the correct position. The support for the catch is simply soldered in place and prevents the catch from sagging. A wire is soldered to the base of the pantagraph and passed through a hole drilled in the roof. Connect this wire to the same terminal on the reverse switch on which the wires from the third rail shoes are hooked. The loco is now capable of operating from an overhead wire. If you intend to keep the pantagraph in its down position it would be best to remove the two coil springs for they will only lose their tension if the pantagraph is left down for a period of time.

The other roof details can now be added to the model. The terminal boxes are filed out of brass and soldered in place. Make the covers for the terminal boxes out of 1/32" sheet brass. The conduits from the pantagraph base to the terminal boxes are made out of 1/16" diameter brass rod. They are supported by stanchions bent out of 1/16" by 1/64" brass strips and soldered into the 1/16" holes drilled in the loco roof. The conduits fit into 1/16" holes drilled in the terminal boxes and are bent up and fitted into the holes drilled in the linen bakelite supports of the pantagraph base.

The mushroom ventilators are simple brass turnings. They are soldered in place



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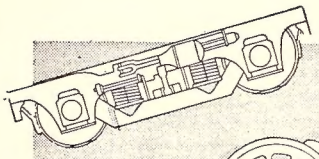

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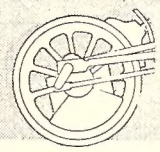
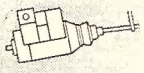
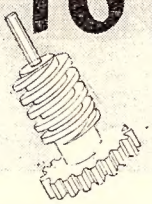
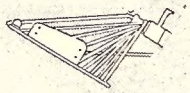
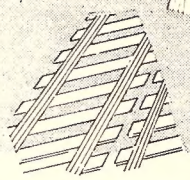
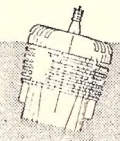

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in ⅛" holes drilled through the roof. The handrails around the roof are built up out of #60 wire.

All that remains is to make the third rail shoes. The construction of the shoes is shown clearly on the perspective drawing. The bracket is cut out of $\frac{1}{32}$" sheet brass and bent to shape. Make the shoe holders out of ⅛" thick brass. The $\frac{1}{16}$" hole through the holder should be a tight fit for a $\frac{1}{16}$" diameter rod. The holes in the bracket should be a loose fit for the rod. Assemble the bracket and holders with the coil spring in place and press the shoes (made out of $\frac{1}{16}$" brass rod) in the $\frac{1}{16}$" holes drilled in the ends of the holders. Do not solder the shoes in place for they wear and will have to be replaced quite often. The third rail shoe assemblies are mounted on the linen bakelite pieces on the pilots with 2-56 screws.

This completes the model and it is ready for painting. Use dull black paint for the best results. The window frames on my model are painted bright red which gives it a nice appearance. The lettering was done with white drawing ink and then the entire model was given a coat of flat varnish to protect the lettering.

RAILROAD CLUB NEWS

(*Continued from page* 5)

SPRINGFIELD, ILL. Having finished a very successful first year which saw the completion of the mainline of its layout, the Central Illinois Model R. R. Club is now looking forward to an equally profitable second year. Meetings are held every Tuesday evening in the club's headquarters at 1901 S. Lincoln Ave. The club layout is in HO gauge, but all model enthusiasts are welcome.

WOODSIDE, N. Y. The Woodhaven Model R. R. Club has been in existence for more than a year and is still puffing along. A two level main line with passing tracks in front and two ramps connecting same have been completed. Work is now being done on a curved trestle for the upper level, and the freight and passenger yards. The club membership stands at a healthy sixteen members—a crowd for one man's cellar!

WEST ORANGE, N. J. A new club has been formed, known as the West Valley Model R. R. Club, with headquarters located at 25 Tremont Ave. Meetings are held every Monday and Wednesday at eight, prospective members are welcome either night. Plans for the completion of the mainline loop are in the blueprinting stage and a three track mainline and a single track branch line are now under construction.

RUTHERFORD, N. J. Model Railroading is coming into its own in Northern Jersey — The South Bergen Model R. R. Club has recently been formed with headquarters on Wilson Ave. Their HO layout is 25' x 17' and is known as the Boiling Spring Lines. Membership is still open, anyone interested is invited to contact the Secretary, Ed Aussichee, 30 Orient Way, Rutherford.

PROVIDENCE, R. I. Space — the major problem of every club — is also affecting the Providence Society of Model Engineers. This club has started construction of an O gauge layout at 150 Friendship St., but as there is only 600 square feet of floor space available, they don't expect to remain long at this address. Every club member is searching for a space of 1000 square feet minimum to house their layout — *it's a wild goose chase, but they're bound to strike something!* To date, they have ten active members with several more in prospect. The meetings are held the second Wednesday of each month at 8:30. Anyone interested in this O gauge, 2-rail club may apply for membership at The Train Shop, 112 Broad Street.

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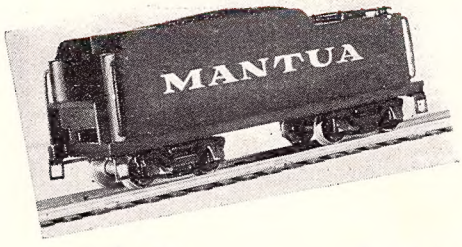

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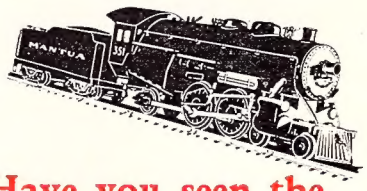

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